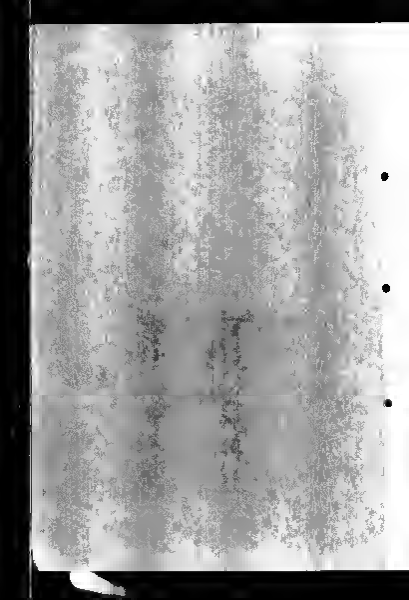
Reference and Guide Book

THE TRENT CANAL



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1911

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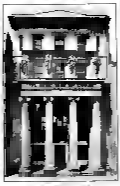

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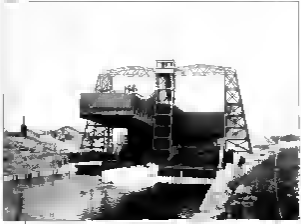

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Size 30 ft. x 36 in. x 14 in. Weight about 140 lbs. Will carry 6 persons and 500 lbs. of duffle.

Size 32 ft. x 36 in. x 14 in. Weight about 150 lbs. Will carry 6 persons and 550 lbs. of duffle.

Size 34 ft. x 36 in. x 14 in. Weight about 160 lbs. Will carry 7 persons and 600 lbs. of duffle.

Size 36 ft. x 36 in. x 14 in. Weight about 170 lbs. Will carry 7 persons and 650 lbs. of duffle.

Size 38 ft. x 36 in. x 14 in. Weight about 180 lbs. Will carry 8 persons and 700 lbs. of duffle.

Size 40 ft. x 36 in. x 14 in. Weight about 190 lbs. Will carry 8 persons and 750 lbs. of duffle.

Size 42 ft. x 36 in. x 14 in. Weight about 200 lbs. Will carry 9 persons and 800 lbs. of duffle.

Size 44 ft. x 36 in. x 14 in. Weight about 210 lbs. Will carry 9 persons and 850 lbs. of duffle.

Size 46 ft. x 36 in. x 14 in. Weight about 220 lbs. Will carry 10 persons and 900 lbs. of duffle.

Size 48 ft. x 36 in. x 14 in. Weight about 230 lbs. Will carry 10 persons and 950 lbs. of duffle.

Size 50 ft. x 36 in. x 14 in. Weight about 240 lbs. Will carry 11 persons and 1000 lbs. of duffle.

Size 52 ft. x 36 in. x 14 in. Weight about 250 lbs. Will carry 11 persons and 1050 lbs. of duffle.

Size 54 ft. x 36 in. x 14 in. Weight about 260 lbs. Will carry 12 persons and 1100 lbs. of duffle.

Size 56 ft. x 36 in. x 14 in. Weight about 270 lbs. Will carry 12 persons and 1150 lbs. of duffle.

Size 58 ft. x 36 in. x 14 in. Weight about 280 lbs. Will carry 13 persons and 1200 lbs. of duffle.

Size 60 ft. x 36 in. x 14 in. Weight about 290 lbs. Will carry 13 persons and 1250 lbs. of duffle.

Size 62 ft. x 36 in. x 14 in. Weight about 300 lbs. Will carry 14 persons and 1300 lbs. of duffle.

Size 64 ft. x 36 in. x 14 in. Weight about 310 lbs. Will carry 14 persons and 1350 lbs. of duffle.

Size 66 ft. x 36 in. x 14 in. Weight about 320 lbs. Will carry 15 persons and 1400 lbs. of duffle.

Size 68 ft. x 36 in. x 14 in. Weight about 330 lbs. Will carry 15 persons and 1450 lbs. of duffle.

Size 70 ft. x 36 in. x 14 in. Weight about 340 lbs. Will carry 16 persons and 1500 lbs. of duffle.

Size 72 ft. x 36 in. x 14 in. Weight about 350 lbs. Will carry 16 persons and 1550 lbs. of duffle.

Size 74 ft. x 36 in. x 14 in. Weight about 360 lbs. Will carry 17 persons and 1600 lbs. of duffle.

Size 76 ft. x 36 in. x 14 in. Weight about 370 lbs. Will carry 17 persons and 1650 lbs. of duffle.

Size 78 ft. x 36 in. x 14 in. Weight about 380 lbs. Will carry 18 persons and 1700 lbs. of duffle.

Size 80 ft. x 36 in. x 14 in. Weight about 390 lbs. Will carry 18 persons and 1750 lbs. of duffle.

Size 82 ft. x 36 in. x 14 in. Weight about 400 lbs. Will carry 19 persons and 1800 lbs. of duffle.

Size 84 ft. x 36 in. x 14 in. Weight about 410 lbs. Will carry 19 persons and 1850 lbs. of duffle.

Size 86 ft. x 36 in. x 14 in. Weight about 420 lbs. Will carry 20 persons and 1900 lbs. of duffle.

Size 88 ft. x 36 in. x 14 in. Weight about 430 lbs. Will carry 20 persons and 1950 lbs. of duffle.

Size 90 ft. x 36 in. x 14 in. Weight about 440 lbs. Will carry 21 persons and 2000 lbs. of duffle.

Size 92 ft. x 36 in. x 14 in. Weight about 450 lbs. Will carry 21 persons and 2050 lbs. of duffle.

Size 94 ft. x 36 in. x 14 in. Weight about 460 lbs. Will carry 22 persons and 2100 lbs. of duffle.

Size 96 ft. x 36 in. x 14 in. Weight about 470 lbs. Will carry 22 persons and 2150 lbs. of duffle.

Size 98 ft. x 36 in. x 14 in. Weight about 480 lbs. Will carry 23 persons and 2200 lbs. of duffle.

Size 100 ft. x 36 in. x 14 in. Weight about 490 lbs. Will carry 23 persons and 2250 lbs. of duffle.

Size 102 ft. x 36 in. x 14 in. Weight about 500 lbs. Will carry 24 persons and 2300 lbs. of duffle.

Size 104 ft. x 36 in. x 14 in. Weight about 510 lbs. Will carry 24 persons and 2350 lbs. of duffle.

Size 106 ft. x 36 in. x 14 in. Weight about 520 lbs. Will carry 25 persons and 2400 lbs. of duffle.

Size 108 ft. x 36 in. x 14 in. Weight about 530 lbs. Will carry 25 persons and 2450 lbs. of duffle.

Size 110 ft. x 36 in. x 14 in. Weight about 540 lbs. Will carry 26 persons and 2500 lbs. of duffle.

Size 112 ft. x 36 in. x 14 in. Weight about 550 lbs. Will carry 26 persons and 2550 lbs. of duffle.

Size 114 ft. x 36 in. x 14 in. Weight about 560 lbs. Will carry 27 persons and 2600 lbs. of duffle.

Size 116 ft. x 36 in. x 14 in. Weight about 570 lbs. Will carry 27 persons and 2650 lbs. of duffle.

Size 118 ft. x 36 in. x 14 in. Weight about 580 lbs. Will carry 28 persons and 2700 lbs. of duffle.

Size 120 ft. x 36 in. x 14 in. Weight about 590 lbs. Will carry 28 persons and 2750 lbs. of duffle.

Size 122 ft. x 36 in. x 14 in. Weight about 600 lbs. Will carry 29 persons and 2800 lbs. of duffle.

Size 124 ft. x 36 in. x 14 in. Weight about 610 lbs. Will carry 29 persons and 2850 lbs. of duffle.

Size 126 ft. x 36 in. x 14 in. Weight about 620 lbs. Will carry 30 persons and 2900 lbs. of duffle.

Size 128 ft. x 36 in. x 14 in. Weight about 630 lbs. Will carry 30 persons and 2950 lbs. of duffle.

Size 130 ft. x 36 in. x 14 in. Weight about 640 lbs. Will carry 31 persons and 3000 lbs. of duffle.

Size 132 ft. x 36 in. x 14 in. Weight about 650 lbs. Will carry 31 persons and 3050 lbs. of duffle.

Size 134 ft. x 36 in. x 14 in. Weight about 660 lbs. Will carry 32 persons and 3100 lbs. of duffle.

Size 136 ft. x 36 in. x 14 in. Weight about 670 lbs. Will carry 32 persons and 3150 lbs. of duffle.

Size 138 ft. x 36 in. x 14 in. Weight about 680 lbs. Will carry 33 persons and 3200 lbs. of duffle.

Size 140 ft. x 36 in. x 14 in. Weight about 690 lbs. Will carry 33 persons and 3250 lbs. of duffle.

Size 142 ft. x 36 in. x 14 in. Weight about 700 lbs. Will carry 34 persons and 3300 lbs. of duffle.

Size 144 ft. x 36 in. x 14 in. Weight about 710 lbs. Will carry 34 persons and 3350 lbs. of duffle.

Size 146 ft. x 36 in. x 14 in. Weight about 720 lbs. Will carry 35 persons and 3400 lbs. of duffle.

Size 148 ft. x 36 in. x 14 in. Weight about 730 lbs. Will carry 35 persons and 3450 lbs. of duffle.

Size 150 ft. x 36 in. x 14 in. Weight about 740 lbs. Will carry 36 persons and 3500 lbs. of duffle.

Size 152 ft. x 36 in. x 14 in. Weight about 750 lbs. Will carry 36 persons and 3550 lbs. of duffle.

Size 154 ft. x 36 in. x 14 in. Weight about 760 lbs. Will carry 37 persons and 3600 lbs. of duffle.

Size 156 ft. x 36 in. x 14 in. Weight about 770 lbs. Will carry 37 persons and 3650 lbs. of duffle.

Size 158 ft. x 36 in. x 14 in. Weight about 780 lbs. Will carry 38 persons and 3700 lbs. of duffle.

Size 160 ft. x 36 in. x 14 in. Weight about 790 lbs. Will carry 38 persons and 3750 lbs. of duffle.

Size 162 ft. x 36 in. x 14 in. Weight about 800 lbs. Will carry 39 persons and 3800 lbs. of duffle.

Size 164 ft. x 36 in. x 14 in. Weight about 810 lbs. Will carry 39 persons and 3850 lbs. of duffle.

Size 166 ft. x 36 in. x 14 in. Weight about 820 lbs. Will carry 40 persons and 3900 lbs. of duffle.

Size 168 ft. x 36 in. x 14 in. Weight about 830 lbs. Will carry 40 persons and 3950 lbs. of duffle.

Size 170 ft. x 36 in. x 14 in. Weight about 840 lbs. Will carry 41 persons and 4000 lbs. of duffle.

Size 172 ft. x 36 in. x 14 in. Weight about 850 lbs. Will carry 41 persons and 4050 lbs. of duffle.

Size 174 ft. x 36 in. x 14 in. Weight about 860 lbs. Will carry 42 persons and 4100 lbs. of duffle.

Size 176 ft. x 36 in. x 14 in. Weight about 870 lbs. Will carry 42 persons and 4150 lbs. of duffle.

Size 178 ft. x 36 in. x 14 in. Weight about 880 lbs. Will carry 43 persons and 4200 lbs. of duffle.

Size 180 ft. x 36 in. x 14 in. Weight about 890 lbs. Will carry 43 persons and 4250 lbs. of duffle.

Size 182 ft. x 36 in. x 14 in. Weight about 900 lbs. Will carry 44 persons and 4300 lbs. of duffle.

Size 184 ft. x 36 in. x 14 in. Weight about 910 lbs. Will carry 44 persons and 4350 lbs. of duffle.

Size 186 ft. x 36 in. x 14 in. Weight about 920 lbs. Will carry 45 persons and 4400 lbs. of duffle.

Size 188 ft. x 36 in. x 14 in. Weight about 930 lbs. Will carry 45 persons and 4450 lbs. of duffle.

Size 190 ft. x 36 in. x 14 in. Weight about 940 lbs. Will carry 46 persons and 4500 lbs. of duffle.

Size 192 ft. x 36 in. x 14 in. Weight about 950 lbs. Will carry 46 persons and 4550 lbs. of duffle.

Size 194 ft. x 36 in. x 14 in. Weight about 960 lbs. Will carry 47 persons and 4600 lbs. of duffle.

Size 196 ft. x 36 in. x 14 in. Weight about 970 lbs. Will carry 47 persons and 4650 lbs. of duffle.

Size 198 ft. x 36 in. x 14 in. Weight about 980 lbs. Will carry 48 persons and 4700 lbs. of duffle.

Size 200 ft. x 36 in. x 14 in. Weight about 990 lbs. Will carry 48 persons and 4750 lbs. of duffle.

Size 202 ft. x 36 in. x 14 in. Weight about 1000 lbs. Will carry 49 persons and 4800 lbs. of duffle.

Size 204 ft. x 36 in. x 14 in. Weight about 1010 lbs. Will carry 49 persons and 4850 lbs. of duffle.

Size 206 ft. x 36 in. x 14 in. Weight about 1020 lbs. Will carry 50 persons and 4900 lbs. of duffle.

Size 208 ft. x 36 in. x 14 in. Weight about 1030 lbs. Will carry 50 persons and 4950 lbs. of duffle.

Size 210 ft. x 36 in. x 14 in. Weight about 1040 lbs. Will carry 51 persons and 5000 lbs. of duffle.

Size 212 ft. x 36 in. x 14 in. Weight about 1050 lbs. Will carry 51 persons and 5050 lbs. of duffle.

Size 214 ft. x 36 in. x 14 in. Weight about 1060 lbs. Will carry 52 persons and 5100 lbs. of duffle.

Size 216 ft. x 36 in. x 14 in. Weight about 1070 lbs. Will carry 52 persons and 5150 lbs. of duffle.

Size 218 ft. x 36 in. x 14 in. Weight about 1080 lbs. Will carry 53 persons and 5200 lbs. of duffle.

Size 220 ft. x 36 in. x 14 in. Weight about 1090 lbs. Will carry 53 persons and 5250 lbs. of duffle.

Size 222 ft. x 36 in. x 14 in. Weight about 1100 lbs. Will carry 54 persons and 5300 lbs. of duffle.

Size 224 ft. x 36 in. x 14 in. Weight about 1110 lbs. Will carry 54 persons and 5350 lbs. of duffle.

Size 226 ft. x 36 in. x 14 in. Weight about 1120 lbs. Will carry 55 persons and 5400 lbs. of duffle.

Size 228 ft. x 36 in. x 14 in. Weight about 1130 lbs. Will carry 55 persons and 5450 lbs. of duffle.

Size 230 ft. x 36 in. x 14 in. Weight about 1140 lbs. Will carry 56 persons and 5500 lbs. of duffle.

Size 232 ft. x 36 in. x 14 in. Weight about 1150 lbs. Will carry 56 persons and 5550 lbs. of duffle.

Size 234 ft. x 36 in. x 14 in. Weight about 1160 lbs. Will carry 57 persons and 5600 lbs. of duffle.

Size 236 ft. x 36 in. x 14 in. Weight about 1170 lbs. Will carry 57 persons and 5650 lbs. of duffle.

Size 238 ft. x 36 in. x 14 in. Weight about 1180 lbs. Will carry 58 persons and 5700 lbs. of duffle.

Size 240 ft. x 36 in. x 14 in. Weight about 1190 lbs. Will carry 58 persons and 5750 lbs. of duffle.

Size 242 ft. x 36 in. x 14 in. Weight about 1200 lbs. Will carry 59 persons and 5800 lbs. of duffle.

Size 244 ft. x 36 in. x 14 in. Weight about 1210 lbs. Will carry 59 persons and 5850 lbs. of duffle.

Size 246 ft. x 36 in. x 14 in. Weight about 1220 lbs. Will carry 60 persons and 5900 lbs. of duffle.

Size 248 ft. x 36 in. x 14 in. Weight about 1230 lbs. Will carry 60 persons and 5950 lbs. of duffle.

Size 250 ft. x 36 in. x 14 in. Weight about 1240 lbs. Will carry 61 persons and 6000 lbs. of duffle.

Size 252 ft. x 36 in. x 14 in. Weight about 1250 lbs. Will carry 61 persons and 6050 lbs. of duffle.

Size 254 ft. x 36 in. x 14 in. Weight about 1260 lbs. Will carry 62 persons and 6100 lbs. of duffle.

Size 256 ft. x 36 in. x 14 in. Weight about 1270 lbs. Will carry 62 persons and 6150 lbs. of duffle.

Size 258 ft. x 36 in. x 14 in. Weight about 1280 lbs. Will carry 63 persons and 6200 lbs. of duffle.

Size 260 ft. x 36 in. x 14 in. Weight about 1290 lbs. Will carry 63 persons and 6250 lbs. of duffle.

Size 262 ft. x 36 in. x 14 in. Weight about 1300 lbs. Will carry 64 persons and 6300 lbs. of duffle.

Size 264 ft. x 36 in. x 14 in. Weight about 1310 lbs. Will carry 64 persons and 6350 lbs. of duffle.

Size 266 ft. x 36 in. x 14 in. Weight about 1320 lbs. Will carry 65 persons and 6400 lbs. of duffle.

Size 268 ft. x 36 in. x 14 in. Weight about 1330 lbs. Will carry 65 persons and 6450 lbs. of duffle.

Size 270 ft. x 36 in. x 14 in. Weight about 1340 lbs. Will carry 66 persons and 6500 lbs. of duffle.

Size 272 ft. x 36 in. x 14 in. Weight about 1350 lbs. Will carry 66 persons and 6550 lbs. of duffle.

Size 274 ft. x 36 in. x 14 in. Weight about 1360 lbs. Will carry 67 persons and 6600 lbs. of duffle.

Size 276 ft. x 36 in. x 14 in. Weight about 1370 lbs. Will carry 67 persons and 6650 lbs. of duffle.

Size 278 ft. x 36 in. x 14 in. Weight about 1380 lbs. Will carry 68 persons and 6700 lbs. of duffle.

Size 280 ft. x 36 in. x 14 in. Weight about 1390 lbs. Will carry 68 persons and 6750 lbs. of duffle.

Size 282 ft. x 36 in. x 14 in. Weight about 1400 lbs. Will carry 69 persons and 6800 lbs. of duffle.

Size 284 ft. x 36 in. x 14 in. Weight about 1410 lbs. Will carry 69 persons and 6850 lbs. of duffle.

Size 286 ft. x 36 in. x 14 in. Weight about 1420 lbs. Will carry 70 persons and 6900 lbs. of duffle.

Size 288 ft. x 36 in. x 14 in. Weight about 1430 lbs. Will carry 70 persons and 6950 lbs. of duffle.

Size 290 ft. x 36 in. x 14 in. Weight about 1440 lbs. Will carry 71 persons and 7000 lbs. of duffle.

Size 292 ft. x 36 in. x 14 in. Weight about 1450 lbs. Will carry 71 persons and 7050 lbs. of duffle.

Size 294 ft. x 36 in. x 14 in. Weight about 1460 lbs. Will carry 72 persons and 7100 lbs. of duffle.

Size 296 ft. x 36 in. x 14 in. Weight about 1470 lbs. Will carry 72 persons and 7150 lbs. of duffle.

Size 298 ft. x 36 in. x 14 in. Weight about 1480 lbs. Will carry 73 persons and 7200 lbs. of duffle.

Size 300 ft. x 36 in. x 14 in. Weight about 1490 lbs. Will carry 73 persons and 7250 lbs. of duffle.

Size 302 ft. x 36 in. x 14 in. Weight about 1500 lbs. Will carry 74 persons and 7300 lbs. of duffle.

Size 304 ft. x 36 in. x 14 in. Weight about 1510 lbs. Will carry 74 persons and 7350 lbs. of duffle.

Size 306 ft. x 36 in. x 14 in. Weight about 1520 lbs. Will carry 75 persons and 7400 lbs. of duffle.

Size 308 ft. x 36 in. x 14 in. Weight about 1530 lbs. Will carry 75 persons and 7450 lbs. of duffle.

Size 310 ft. x 36 in. x 14 in. Weight about 1540 lbs. Will carry 76 persons and 7500 lbs. of duffle.

Size 312 ft. x 36 in. x 14 in. Weight about 1550 lbs. Will carry 76 persons and 7550 lbs. of duffle.

Size 314 ft. x 36 in. x 14 in. Weight about 1560 lbs. Will carry 77 persons and 7600 lbs. of duffle.

Size 316 ft. x 36 in. x 14 in. Weight about 1570 lbs. Will carry 77 persons and 7650 lbs. of duffle.

Size 318 ft. x 36 in. x 14 in. Weight about 1580 lbs. Will carry 78 persons and 7700 lbs. of duffle.

Size 320 ft. x 36 in. x 14 in. Weight about 1590 lbs. Will carry 78 persons and 7750 lbs. of duffle.

Size 322 ft. x 36 in. x 14 in. Weight about 1600 lbs. Will carry 79 persons and 7800 lbs. of duffle.

Size 324 ft. x 36 in. x 14 in. Weight about 1610 lbs. Will carry 79 persons and 7850 lbs. of duffle.

Size 326 ft. x 36 in. x 14 in. Weight about 1620 lbs. Will carry 80 persons and 7900 lbs. of duffle.

Size 328 ft. x 36 in. x 14 in. Weight about 1630 lbs. Will carry 80 persons and 7950 lbs. of duffle.

Size 330 ft. x 36 in. x 14 in. Weight about 1640 lbs. Will carry 81 persons and 8000 lbs. of duffle.

Size 332 ft. x 36 in. x 14 in. Weight about 1650 lbs. Will carry 81 persons and 8050 lbs. of duffle.

Size 334 ft. x 36 in. x 14 in. Weight about 1660 lbs. Will carry 82 persons and 8100 lbs. of duffle.

Size 336 ft. x 36 in. x 14 in. Weight about 1670 lbs. Will carry 82 persons and 8150 lbs. of duffle.

Size 338 ft. x 36 in. x 14 in. Weight about 1680 lbs. Will carry 83 persons and 8200 lbs. of duffle.

Size 340 ft. x 36 in. x 14 in. Weight about 1690 lbs. Will carry 83 persons and 8250 lbs. of duffle.

Size 342 ft. x 36 in. x 14 in. Weight about 1700 lbs. Will carry 84 persons and 8300 lbs. of duffle.

Size 344 ft. x 36 in. x 14 in. Weight about 1710 lbs. Will carry 84 persons and 8350 lbs. of duffle.

Size 346 ft. x 36 in. x 14 in. Weight about 1720 lbs. Will carry 85 persons and 8400 lbs. of duffle.

Size 348 ft. x 36 in. x 14 in. Weight about 1730 lbs. Will carry 85 persons and 8450 lbs. of duffle.

Size 350 ft. x 36 in. x 14 in. Weight about 1740 lbs. Will carry 86 persons and 8500 lbs. of duffle.

Size 352 ft. x 36 in. x 14 in. Weight about 1750 lbs. Will carry 86 persons and 8550 lbs. of duffle.

Size 354 ft. x 36 in. x 14 in. Weight about 1760 lbs. Will carry 87 persons and 8600 lbs. of duffle.

Size 356 ft. x 36 in. x 14 in. Weight about 1770 lbs. Will carry 87 persons and 8650 lbs. of duffle.

Size 358 ft. x 36 in. x 14 in. Weight about 1780 lbs. Will carry 88 persons and 8700 lbs. of duffle.

Size 360 ft. x 36 in. x 14 in. Weight about 1790 lbs. Will carry 88 persons and 8750 lbs. of duffle.

Size 362 ft. x 36 in. x 14 in. Weight about 1800 lbs. Will carry 89 persons and 8800 lbs. of duffle.

Size 364 ft. x 36 in. x 14 in. Weight about 1810 lbs. Will carry 89 persons and 8850 lbs. of duffle.

Size 366 ft. x 36 in. x 14 in. Weight about 1820 lbs. Will carry 90 persons and 8900 lbs. of duffle.

Size 368 ft. x 36 in. x 14 in. Weight about 1830 lbs. Will carry 90 persons and 8950 lbs. of duffle.

Size 370 ft. x 36 in. x 14 in. Weight about 1840 lbs. Will carry 91 persons and 9000 lbs. of duffle.

Size 372 ft. x 36 in. x 14 in. Weight about 1850 lbs. Will carry 91 persons and 9050 lbs. of duffle.

Size 374 ft. x 36 in. x 14 in. Weight about 1860 lbs. Will carry 92 persons and 9100 lbs. of duffle.

Size 376 ft. x 36 in. x 14 in. Weight about 1870 lbs. Will carry 92 persons and 9150 lbs. of duffle.

Size 378 ft. x 36 in. x 14 in. Weight about 1880 lbs. Will carry 93 persons and 9200 lbs. of duffle.

Size 380 ft. x 36 in. x 14 in. Weight about 1890 lbs. Will carry 93 persons and 9250 lbs. of duffle.

Size 382 ft. x 36 in. x 14 in. Weight about 1900 lbs. Will carry 94 persons and 9300 lbs. of duffle.

Size 384 ft. x 36 in. x 14 in. Weight about 1910 lbs. Will carry 94 persons and 9350 lbs. of duffle.

Size 386 ft. x 36 in. x 14 in. Weight about 1920 lbs. Will carry 95 persons and 9400 lbs. of duffle.

Size 388 ft. x 36 in. x 14 in. Weight about 1930 lbs. Will carry 95 persons and 9450 lbs. of duffle.

Size 390 ft. x 36 in. x 14 in. Weight about 1940 lbs. Will carry 96 persons and 9500 lbs. of duffle.

Size 392 ft. x 36 in. x 14 in. Weight about 1950 lbs. Will carry 96 persons and 9550 lbs. of duffle.

Size 394 ft. x 36 in. x 14 in. Weight about 1960 lbs. Will carry 97 persons and 9600 lbs. of duffle.

Size 396 ft. x 36 in. x 14 in. Weight about 1970 lbs. Will carry 97 persons and 9650 lbs. of duffle.

Size 398 ft. x 36 in. x 14 in. Weight about 1980 lbs. Will carry 98 persons and 9700 lbs. of duffle.

Size 400 ft. x 36 in. x 14 in. Weight about 1990 lbs. Will carry 98 persons and 9750 lbs. of duffle.

Size 402 ft. x 36 in. x 14 in. Weight about 2000 lbs. Will carry 99 persons and 9800 lbs. of duffle.

Size 404 ft. x 36 in. x 14 in. Weight about 2010 lbs. Will carry 99 persons and 9850 lbs. of duffle.

Size 406 ft. x 36 in. x 14 in. Weight about 2020 lbs. Will carry 100 persons and 9900 lbs. of duffle.

Size 408 ft. x 36 in. x 14 in. Weight about 2030 lbs. Will carry 100 persons and 9950 lbs. of duffle.

Size 410 ft. x 36 in. x 14 in. Weight about 2040 lbs. Will carry 101 persons and 10000 lbs. of duffle.

Size 412 ft. x 36 in. x 14 in. Weight about 2050 lbs. Will carry 101 persons and 10050 lbs. of duffle.

Size 414 ft. x 36 in. x 14 in. Weight about 2060 lbs. Will carry 102 persons and 10100 lbs. of duffle.

Size 416 ft. x 36 in. x 14 in. Weight about 2070 lbs. Will carry 102 persons and 10150 lbs. of duffle.

Size 418 ft. x 36 in. x 14 in. Weight about 2080 lbs. Will carry 103 persons and 10200 lbs. of duffle.

Size 420 ft. x 36 in. x 14 in. Weight about 2090 lbs. Will carry 103 persons and 10250 lbs. of duffle.

Size 422 ft. x 36 in. x 14 in. Weight about 2100 lbs. Will carry 104 persons and 10300 lbs. of duffle.

Size 424 ft. x 36 in. x 14 in. Weight about 2110 lbs. Will carry 104 persons and 10350 lbs. of duffle.

Size 426 ft. x 36 in. x 14 in. Weight about 2120 lbs. Will carry 105 persons and 10400 lbs. of duffle.

Size 428 ft. x 36 in. x 14 in. Weight about 2130 lbs. Will carry 105 persons and 10450 lbs. of duffle.

Size 430 ft. x 36 in. x 14 in. Weight about 2140 lbs. Will carry 106 persons and 10500 lbs. of duffle.

Size 432 ft. x 36 in. x 14 in. Weight about 2150 lbs. Will carry 106 persons and 10550 lbs. of duffle.

Size 434 ft. x 36 in. x 14 in. Weight about 2160 lbs. Will carry 107 persons and 10600 lbs. of duffle.

Size 436 ft. x 36 in. x 14 in. Weight about 2170 lbs. Will carry 107 persons and 10650 lbs. of duffle.

Size 438 ft. x 36 in. x 14 in. Weight about 2180 lbs. Will carry 108 persons and 10700 lbs. of duffle.

Size 440 ft. x 36 in. x 14 in. Weight about 2190 lbs. Will carry 108 persons and 10750 lbs. of duffle.

Size 442 ft. x 36 in. x 14 in. Weight about 2200 lbs. Will carry 109 persons and 10800 lbs. of duffle.

Size 444 ft. x 36 in. x 14 in. Weight about 2210 lbs. Will carry 109 persons and 10850 lbs. of duffle.

Size 446 ft. x 36 in. x 14 in. Weight about 2220 lbs. Will carry 110 persons and 10900 lbs. of duffle.

Size 448 ft. x 36 in. x 14 in. Weight about 2230 lbs. Will carry 110 persons and 10950 lbs. of duffle.

Size 450 ft. x 36 in. x 14 in. Weight about 2240 lbs. Will carry 111 persons and 11000 lbs. of duffle.

Size 452 ft. x 36 in. x 14 in. Weight about 2250 lbs. Will carry 111 persons and 11050 lbs. of duffle.

Size 454 ft. x 36 in. x 14 in. Weight about 2260 lbs. Will carry 112 persons and 11100 lbs. of duffle.

Size 456 ft. x 36 in. x 14 in. Weight about 2270 lbs. Will carry 112 persons and 11150 lbs. of duffle.

Size 458 ft. x 36 in. x 14 in. Weight about 2280 lbs. Will carry 113 persons and 11200 lbs. of duffle.

Size 460 ft. x 36 in. x 14 in. Weight about 2290 lbs. Will carry 113 persons and 11250 lbs. of duffle.

Size 462 ft. x 36 in. x 14 in. Weight about 2300 lbs. Will carry 114 persons and 11300 lbs. of duffle.

Size 464 ft. x 36 in. x 14 in. Weight about 2310 lbs. Will carry 114 persons and 11350 lbs. of duffle.

Size 466 ft. x 36 in. x 14 in. Weight about 2320 lbs. Will carry 115 persons and 11400 lbs. of duffle.

Size 468 ft. x 36 in. x 14 in. Weight about 2330 lbs. Will carry 115 persons and 11450 lbs. of duffle.

Size 470 ft. x 36 in. x 14 in. Weight about 2340 lbs. Will carry 116 persons and 11500 lbs. of duffle.

Size 472 ft. x 36 in. x 14 in. Weight about 2350 lbs. Will carry 116 persons and 11550 lbs. of duffle.

Size 474 ft. x 36 in. x 14 in. Weight about 2360 lbs. Will carry 117 persons and 11600 lbs. of duffle.

Size 476 ft. x 36 in. x 14 in. Weight about 2370 lbs. Will carry 117 persons and 11650 lbs. of duffle.

Size 478 ft. x 36 in. x 14 in. Weight about 2380 lbs. Will carry 118 persons and 11700 lbs. of duffle.

Size 480 ft. x 36 in. x 14 in. Weight about 2390 lbs. Will carry 118 persons and 11750 lbs. of duffle.

Size 482 ft. x 36 in. x 14 in. Weight about 2400 lbs. Will carry 119 persons and 11800 lbs. of duffle.

Size 484 ft. x 36 in. x 14 in. Weight about 2410 lbs. Will carry 119 persons and 11850 lbs. of duffle.

Size 486 ft. x 36 in. x 14 in. Weight about 2420 lbs. Will carry 120 persons and 11900 lbs. of duffle.

Size 488 ft. x 36 in. x 14 in. Weight about 2430 lbs. Will carry 120 persons and 11950 lbs. of duffle.

Size 490 ft. x 36 in. x 14 in. Weight about 2440 lbs. Will carry 121 persons and 12000 lbs. of duffle.

Size 492 ft. x 36 in. x 14 in. Weight about 2450 lbs. Will carry 121 persons and 12050 lbs. of duffle.

Size 494 ft. x 36 in. x 14 in. Weight about 2460 lbs. Will carry 122 persons and 12100 lbs. of duffle.

Size 496 ft. x 36 in. x 14 in. Weight about 2470 lbs. Will carry 122 persons and 12150 lbs. of duffle.

Size 498 ft. x 36 in. x 14 in. Weight about 2480 lbs. Will carry 123 persons and 12200 lbs. of duffle.

Size 500 ft. x 36 in. x 14 in. Weight about 2490 lbs. Will carry 123 persons and 12250 lbs. of duffle.

Size 502 ft. x 36 in. x 14 in. Weight about 2500 lbs. Will carry 124 persons and 12300 lbs. of duffle.

Size 504 ft. x 36 in. x 14 in. Weight about 2510 lbs. Will carry 124 persons and 12350 lbs. of duffle.

Size 506 ft. x 36 in. x 14 in. Weight about 2520 lbs. Will carry 125 persons and 12400 lbs. of duffle.

Size 508 ft. x 36 in. x 14 in. Weight about 2530 lbs. Will carry 125 persons and 12450 lbs. of duffle.

Size 510 ft. x 36 in. x 14 in. Weight about 2540 lbs. Will carry 126 persons and 12500 lbs. of duffle.

Size 512 ft. x 36 in. x 14 in. Weight about 2550 lbs. Will carry 126 persons and 12550 lbs. of duffle.

Size 514 ft. x 36 in. x 14 in. Weight about 2560 lbs. Will carry 127 persons and 12600 lbs. of duffle.

Size 516 ft. x 36 in. x 14 in. Weight about 2570 lbs. Will carry 127 persons and 12650 lbs. of duffle.

Size 518 ft. x 36 in. x 14 in. Weight about 2580 lbs. Will carry 128 persons and 12700 lbs. of duffle.

Size 520 ft. x 36 in. x 14 in. Weight about 2590 lbs. Will carry 128 persons and 12750 lbs. of duffle.

Size 522 ft. x 36 in. x 14 in. Weight about 2600 lbs. Will carry 129 persons and 12800 lbs. of duffle.

Size 524 ft. x 36 in. x 14 in. Weight about 2610 lbs. Will carry 129 persons and 12850 lbs. of duffle.

Size 526 ft. x 36 in. x 14 in. Weight about 2620 lbs. Will carry 130 persons and 12900 lbs. of duffle.

Size 528 ft. x 36 in. x 14 in. Weight about 2630 lbs. Will carry 130 persons and 12950 lbs. of duffle.

Size 530 ft. x 36 in. x 14 in. Weight about 2640 lbs. Will carry 131 persons and 13000 lbs. of duffle.

Size 532 ft. x 36 in. x 14 in. Weight about 2650 lbs. Will carry 131 persons and 13050 lbs. of duffle.

Size 534 ft. x 36 in. x 14 in. Weight about 2660 lbs. Will carry 132 persons and 13100 lbs. of duffle.

Size 536 ft. x 36 in. x 14 in. Weight about 2670 lbs. Will carry 132 persons and 13150 lbs. of duffle.

Size 538 ft. x 36 in. x 14 in. Weight about 2680 lbs. Will carry 133 persons and 13200 lbs. of duffle.

Size 540 ft. x 36 in. x 14 in. Weight about 2690 lbs. Will carry 133 persons and 13250 lbs. of duffle.

Size 542 ft. x 36 in. x 14 in. Weight about 2700 lbs. Will carry 134 persons and 13300 lbs. of duffle.

Size 544 ft. x 36 in. x 14 in. Weight about 2710 lbs. Will carry 134 persons and 13350 lbs. of duffle.

Size 546 ft. x 36 in. x 14 in. Weight about 2720 lbs. Will carry 135 persons and 13400 lbs. of duffle.

Size 548 ft. x 36 in. x 14 in. Weight about 2730 lbs. Will carry 135 persons and 13450 lbs. of duffle.

Size 550 ft. x 36 in. x 14 in. Weight about 2740 lbs. Will carry 136 persons and 13500 lbs. of duffle.

Size 552 ft. x 36 in. x 14 in. Weight about 2750 lbs. Will carry 136 persons and 13550 lbs. of duffle.

Size 554 ft. x 36 in. x 14 in. Weight about 2760 lbs. Will carry 137 persons and 13600 lbs. of duffle.

Size 556 ft. x 36 in. x 14 in. Weight about 2770 lbs. Will carry 137 persons and 13650 lbs. of duffle.

Size 558 ft. x 36 in. x 14 in. Weight about 2780 lbs. Will carry 138 persons and 13700 lbs. of duffle.

Size 560 ft. x 36 in. x 14 in. Weight about 2790 lbs. Will carry 138 persons and 13750 lbs. of duffle.

Size 562 ft. x 36 in. x 14 in. Weight about 2800 lbs. Will carry 139 persons and 13800 lbs. of duffle.

Size 564 ft. x 36 in. x 14 in. Weight about 2810 lbs. Will carry 139 persons and 13850 lbs. of duffle.

Size 566 ft. x 36 in. x 14 in. Weight about 2820 lbs. Will carry 140 persons and 13900 lbs. of duffle.

Size 568 ft. x 36 in. x 14 in. Weight about 2830 lbs. Will carry 140 persons and 13950 lbs. of duffle.

Size 570 ft. x 36 in. x 14 in. Weight about 2840 lbs. Will carry 141 persons and 14000 lbs. of duffle.

Size 572 ft. x

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TORONTO - ONTARIO

REFERENCE AND GUIDE BOOK

OF

THE TRENT CANAL

INCLUDING

KAWARTHA LAKES

LAKE SIMCOE

LAKE COUCHICHING

1911 EDITION

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INTRODUCTION

During the past few years there have been a great many requests for detailed information regarding the Trent Canal. This has especially been the case since the completion of what is known as the Lake Simcoe-Balsam Lake Division, thereby uniting, as it did, an uninterrupted stretch of navigation of 160 miles, connecting from Orillia on Lake Simcoe to Healey's Falls on the Trent River. The fascinating peculiarity of this system of lakes and rivers also necessitates the Trent Canal as tourist and summer-resort; thereby the added attraction to the various yacht associations has increased in large proportions and has now become a thought considered matter from the Trent River to points on Lake Simcoe. With this increase in the number of yachts and steamboats has arisen an increased demand for charts of this delightful channel, and for information regarding the Canal generally. It is therefore with view of aiding the desire for enlarged knowledge in these respects that this book is compiled. Efforts are directed to present herein in as complete and condensed a manner as circumstances will permit charts of the various inlets which will prove useful to navigators, facts concerning the early history of the Canal and more or less comprehensive details generally concerning the purchase the Canal occupied at the present time and is destined in course to be the mission of Canadian transportation.

It regret that at the date of the publication of this work no official charts were available in the Railways and Canals department, defining the hydrographic channels of the greater portion of the lakes and rivers that constitute the Trent Canal. The charts presented herein, while unofficial, are for the most part based upon the observation and acquaintance of practical navigators, and will be found sufficiently reliable in pursuit of navigation with reasonable care and safety the 160 miles of Canal and connecting waters, between Orillia and Healey's Falls. The chart of Lake Simcoe, however, which is herein published, is absolutely reliable, and cannot be found inaccurate in vessel courses on Lake Simcoe.

J. S. CLARKE

Trent

MADE THE FIRST TRIP

THAT the route of the Erie Canal via the Hudson and Three Rivers, now a navigable channel of water communication between Lake Huron and Lake Ontario by the inland lakes of northern pa, is a well known fact. The Huron Indians, who resided long in shores of Lake Huron and Lake Simcoe, were probably first to make this commercially short water route to the Bay of Quinte. After paddling across Lake Simcoe and up the Rice R in her canoe this afternoon, this paragraph across to Balsam Lake, the summit waters between Georgian Bay and Lake Ontario. Hence we re-enter here our big sister Rush Lake Simcoe to Balsam Lake, also is known as the Portage Road.

Before the canal was built there was but a trail over which the Indians carried their canoes and supplies from one lake to the other. It crossed the summit near the present village of Coboconk, and was known as the Portage Road. Over this trail Champlain passed on his journey from Lake Huron to Lake Ontario by way of the Trent River, more than three hundred years ago.

Champlain the French explorer was the first white man to cross down from Lake Huron to Lake Ontario by way of what came to be known nearly three hundred years later as the Erie Canal. This was in 1615, just 3 years after the discovery of Lake Huron by Etienne Brule. In this story of Champlain's trip over these waters is told by Frederic Parkman in his story "Pioneers of France in the New World" a most interesting, Champlain and party left the Thames River and portaged over on Lake Simcoe, soon down the French River into Lake Huron. He sparkles down through the Lakes and History that now constitute the Great Canal. It has been left to one historian's care world's

As the route of Lake Simcoe they all stopped in Rice—their steps somewhere for a considerable. Hunter and, the intrepid Etienne Brule. At the same reminder, set sail with twelve Indians in canoes forward for five hundred about travelers in dangerous waters, since has course, and it through the borders of the Iroquois

He set out in the eighth of September and on the morning of the ninth, Champlain, outgrew in his fashion, awoke to new the attendant marching with an early from, were to visit, to under the bright autumnal sun. The Huron fleet pursued it course along Lake Simcoe, across the portage to Balsam a Sturgeon Lake and down the chain of lakes at last down the narrows of the river Trent. A the long line of canoes moved on its way, at times the one, to that of friend to him you an home on in fancy of Champlain the hunters of the virgin summit decked a his grimes and shrubbery by the heads of new and the silken tress hand with paper-lace, tassels decorations of shreds-grateful

They stopped and celebrated for a four-days. For a hundred leagues, in fact for the descendants of in every ad-paying in battle, drove the game in the end a a woody point and the canoe-new lifted down with spears and arrows in her bank to the river Champlain and his new family relished the sport but paid a heavy price for their pleasure. A Pennsylvania living at a hunt brought down an Indian and there was need of every gun to vanquish the enemy and his friends.

The names now named from the details of the Trent. Lake is full of mountain wildness that yet lately but upon Lake Ontario, around it to safety and finally within the borders of New York, in at near the point of land was at Hungry Bay

The First Survey

It is just 76 years ago since the first survey was made of the proposed route of the Trent Canal. Twenty-four years later the project was discussed at considerable length in "Canadian Pamphlets" and a review of the efforts of the people of the Trent District to have the scheme carried to a successful issue is an interesting study, as are those who at that time in pressing its claims to notice came from Canadian Pamphlets, it will be remembered, to Dundas Street. Although the Trent Canal scheme was a big undertaking at that time, and is so even now, it looks curious also in the end by comparison with the Trent Canal proposals as great many years to the very day, as noted from newspaper files. Perhaps indeed the larger scheme of the Ontario River route—hence, not subject to international Canadian Pamphlet. On March 1, 1831 at [illegible] the people of communities the waters of Lake Ontario with those of Huron by means of a Canal passing through Yore Lake and the Bay of Quinte. [illegible] Bay of Quinte and [illegible] of the Commissioners of the Trent. [illegible] Commissioners appointed by the Province—Sir John Colborne to make a survey of the water communication from the north end of Simcoe Lake to the navigable of the Bay of Quinte. He accordingly made the survey in 1833 and in the year completed the survey of the [illegible] and Dundas. Plans, drawings and surface measurements of the [illegible] were prepared to know the exact length of the Otonabee and back waters to Lake Simcoe. The report [illegible] was very favorable. The estimates for the work [illegible] were prepared and all matters as to [illegible] and water communication between [illegible] Lake Ontario, a distance of about 80 miles, and 1000—a foot of [illegible] £300,000.

Mr. Keefer [illegible] reported, and stated that the estimates the Colborne made those the [illegible] [illegible] [illegible] which he attached were carefully made and approximate the [illegible] [illegible] [illegible] the [illegible] [illegible] sections of the Canal should be at once executed with and the other portions be followed for which, were the [illegible] [illegible] [illegible] [illegible] those [illegible] sections should [illegible] [illegible] [illegible] [illegible]

...ed with the Western States. Two projects to that end are before the public, the one to connect the Georgian Bay with the City of Toronto preliminary surveys of which have already been made assuring it as to a work of great, though by no means insuperable difficulty and the other to connect Lake Huron with the Ottawa, a project to which Sir Wilfrid Laurier pays no slight attention. Provincial Engineers, has given his attention for a time to some project, that neither of these schemes possesses as they unquestionably do, can for a single moment compare with that previously in hand to which reference has been made. The first, in addition to its immense expenses of its work $20 000 000 owing to the heavy rainfall that requires to be made and the great engineering difficulties that must be surmounted, offers but problematical advantages as a commercial work. The I would point of very great advantage to the City of Toronto and direct trade of the southern trade although that city is undoubted but little the less than until the end expected, but here proposed does not be sufficiently to the interior as a new outlet and the produce since on Ontario through Toronto alone, could chance of finding its way to the Atlantic through American waterways Chamber channels. The second promises that of not leaving the waters of Lake Huron with those of the Ontario, north Easterly from on a southern footprint. It proposes to it would open up an immense number of country and particularly southern and western districts of placing Canadian channels for before the other for the conveyance of the products of the west to the eastern of large advantage which cannot be calculated in the commission of the proposed work. But the heavy money required on such a work, they be no that be can obtain for many years. The route via Penetanguishene and the Trent Valley canal, whose upper waters unite in those of the Ottawa Canal, as regards the opening up of the country and the development of trade for the St. Lawrence is as much less superior to other much greater purpose of immediate consideration. The advantages of the Trent route more than once commended in a letter recently addressed by W S Lanigan Esquire to the Civil Commissioner of Public Works

First as to shorter and more direct time and other purpose St. Victoria and Georgian Bay Much, than its great rival, may be said about as impracticable for the winter and for South Sea Straits is the southward, whether via Portsmouth Quebec to Portland or New York

Secondly — It possess through a rich and fertile country and presents fewer engineering difficulties, and could therefore be constructed for much greater economy, than either of the other proposed routes.

Thirdly — Being at once the shortest, the best route from the Ottawa route, it would have the advantage of being equal for two or three months longer every season.

Fourthly — Its terminus Lakeshore would be large and commodious — particularly that at the mouth of the Trent — having an ample the City of Quinte and on the other by a short and commercial the entrance into the Princess Isle Bay the safest and commodious harbors on Lake Ontario thus affording its easy and safe entrance to Toronto from Lake Ontario and to the Lakes.

The advantages of the Trent Route by just it remains may be estimated by the following figures

From Chicago to New York, via Buffalo and Erie Canal	1151 miles
From Chicago to New York, via Welland Canal and Oswego	918
From Chicago to New York, via Huron Ryerson, Ontario & Champlain ship Canal	708
From Chicago to New York, via Georgian Bay Valley of the Trent and Oswego	577
From Chicago to Montreal via Lake Nipissing	1000
From Chicago to Montreal via Georgian Bay and Valley of the Trent	903

It will thus be seen that a point of distance to New York via the Trent, but to advantage over the Welland and the Ottawa canal by 30 miles. With reference to Montreal 300 Montreal the distance is 1000 miles in favor of the Trent route, all routes are overburdened by the various and effect, in spite of all labour.

But be that as it work. He does not hardly be place attempt to discuss the subject and the matter it before reference requested to regard the remarks relative to the routes of a Board Chief Engineer how before me as this is presentment a sole absolute

Such are the position of the various Lake Huron-Lake Ontario short schemes on over-land Canadian Expedition. to the year 1877

Note

Started By Imperial Government

As already been stated, the idea has been the Child of Peterborough and the Trent & Marriage on the north West were built by the year 1833 by themselves. The construction of these two locks was the first step in a practical effort to connect Georgian Bay and Lake Ontario by means of this route, and they were built by the Imperial Government. As a matter of fact, it was by the locks to which the name first to Glen Ray, which locates perhaps as early as Champlain's Report, about 14 miles above the west of Dundas. Mr. Christie's Report was written at one of the most important points to build one of the first locks on the system, but we venture to say that from Burlington, as could not afford any local benefit, nor did it throw open any substantial political stretch of country. Its main value seemed to lead it principally toward the great Seaboard which lay to the south of the western Counties, and for 30 years or more it served as a resource to the enterprise of the Imperial Government. The lock at Clarence's was concluded within a year or two ago, to take the place for the old wooden and modern concrete lock, which is already completed, and which is open to use of the. A lock now being built on the Centre-Line Lake section of the Canal. The lock at Burlington, which affords a means of navigation from Hamilton's Point to Burlington at a distance of 34 miles, connected to some 14 miles was over ago, when it was closed and dismantled to be replaced by a more modern and much larger one. The lock at Peterborough has been discovered when he visited reconstructed, but its walls are about the same as they were when first built.

Some locks had been built at several points, but their construction was upon with a view to meeting the requirements of local interests rather than with a view to a scheme of through navigation. In fact, as far back as the year 1826, a local was built by the "Select Water Communication" at Bytown-town, which afforded a means of navigation from Shepherd Lake to Upper Rockburn and Chaudiere Lakes. In the year 1827, the construction of a lock was commenced at Chelsey on the Rideau River, and it was finished and opened the year 1832. It opened a means of navigation to Port Perry and other points on Lake Scugog. In 1828, a wooden lock was built at Burnside, connecting Kashoot and Cameron Lakes and across the same date the building of the present lock at Trenton's Point was undertaken. While completed a few years later, it afforded navigation for vessels between Lakefield and Burleigh Falls and other points on Seven Lakes.

However, the idea of connecting Lake Huron and Lake Ontario by means of a canal through the Trent Valley may be considered dead. The interest taken in the project by Sir John Colborne, Lieutenant Governor and afterwards Governor-General, had before all these matters from the Old Country to establish communication between our own ports. Just years ago for discussion was renewed between the Provinces. About 1825 Sir W. H. Hooper at a Sir Peterborough, called attention there to the great value of the waterway, and urged the necessity of its improvement by the Government and by qualified personal if by means in the shores and to the point. Among the men in this connection in 1827 at the time of Confederation, the Irish Privy Council was concerned the matter on these waters and their control for the protection of Canada, contemplate in the consideration of the project.

Soon after 1830 Sir Hercules Pratt, of Scarborough, took up the matter personalized much attention and by his energetic efficiency succeeded renewed discussion in his presence. His efforts, however, for its improvement in a private enterprise, and even proceeded in London to secure the interest of capitalists, but circumstances at the time were not propitious, and he was not successful in his efforts.

In 1878 the question was again brought up in a new light. The Ontario Government consulted from the Mackenzie Administration a member of them of the works on the Trent and this was strongly opposed in the local press, as giving no assistance expressly connected

at Cambelltown and finally duplicating the idea of ever passing the Trent Waterway for transportation. The proposition looked reasonable on the view and when that summer they proceeded to pursue they maintained the same free-and-easy making the trouble. In the years 1778 to 1781 considerable survey work was done with a view to proceeding with the construction of the Canal. Mr. David Davis, C.E. and Mr. Thomas Eddington had been in total harmony engaged in the work. Mr. Thos. B. Bateman, Resident Superintending Engineer.

The operations by the people on the Trent Valley district broke out pretty strongly about the year 1776 and by the year 1781 matters were getting to the Committee Co-ordinate for the construction of the canal at Fazeley Falls, Stapeford, Lowesley and Burleigh Falls. About 1867 these matters were thrown open for navigation, completing an inland navigation navigation from Burton Lake to Lowesley. A few years had then elapsed for the completion of the Canal became stronger and more popular than ever. Trent Canal Associations were organized, shareholders representing the entire district from Burton to Trent Valley Canals, and for passenger schemes were handed out and society with a vengeance and a Canal fever was to be heard at public meetings.

Mr. Thomas Hastings, one of the Government Engineers in charge of the work, was appointed at being interested in the project, and a glance at the report and estimate made by him on the proposed work made evident the fact that the line was not feasible, nor with estimates for the completion of the Canal. The Government of him A Macdonald finally decided to appoint a committee to ascertain the merits of the proposal. The recommendation was by very unfavourably read out by the friends of the project, who felt the feasibility of the scheme; as well as by ownership had been by no considered. However the Commissioners was appointed in 1867 by an agreement of Messrs. John Walter Peter Bateman, John Gilbert, C.E. Raymond, and Frank Calvert C.E. Darwin. They were to consider the question of further communication with the water communication between Lowesley Harcon and Lake Erewash and to determine what is advisable that an extension of the main work should be undertaken and if so to what extent. And under date of December 17th 1866 these Commissioners after personally going over the route during summer of various years Colonel Gilbert, Captain Peterson, Mr. Calvert, and Darwin, reported

In considering the locality of the Canal upon the development of the trade and natural resources of the country through which it will pass, it should be noted that the conditions are peculiar inasmuch as it would not as a stationary trade in those of large and extensive which the canal part is contiguous to the line of the Canal and they would therefore afford access to an extent of property and mineral that much greater than would to a Canal of no length

The Commissioners, upon the evidence and information, and it does have been able to examine, and which accompany this report, are of opinion that the extension of the main work should be undertaken by the corporation, as such in agreement and proceeding of the work necessary to give continuous navigation from Burton Lake to the line of canal. This would embrace the connexion between Lowesley and Peterborough and between Hooley's Falls and Burton. In the opinion of the Commissioners whose direction by trade which would not increase this value to the works although consequent but would almost not develop the interests among we want and also in the extension of to country through which it would pass, to such an extent as to repay investments for the expenditure necessary to be incurred although the work itself would not be expected to produce direct revenue.

This conclusion is not at as to a careful consideration of the evidence adduced before the Commission by which the Commissioners feel they would be guilted such evidence as their duties greatly preponderating in favor of the execution of this important work to their course indicated

Although the Commission reported favorably to the completion of the Trent Canal in December 1866 and although strong pressure was brought to bear upon the Government of the day to have new northern undertaken was not until 1868 but my name was made in his

Also

earlier Contracts were, in this year (as for the construction of the division connecting Swan Lake Section to Salmon Lake, and for the Peterborough-Lakefield section. Out of the contracts for the Peterborough-Lakefield section included the construction of the Peterborough Lift Lock, while the Kirkfield hydraulic lift lock was included in one of the contracts of the Lake Simcoe-Balsam Lake Division. The Peterborough hydraulic Lift Lock was opened in June 1904, and the Kirkfield Hydraulic Lift Lock in July 1907 thereby opening upon a stretch of navigation 90 miles of length, from Orillia to Healey's Falls

The Peterborough-Lakefield Division and the Balsam Lake-Lake Simcoe Division were both under the supervision of Mr Ia is Rogers, M. Can. Soc. C. E., who from 1899 to 1907 was Superintending Engineer of the Trent Canal. When it was first suggested that hydraulic lift locks should be built on the Trent Canal Mr Rogers was instructed by the Department to proceed to Europe with others of studying the matter of lift locks and their uses, and report to the Department the result of his investigations. Mr Rogers made the visit, gave the subject thorough investigation, secured a large fund of information having personal and first European locks of operation and reported favorably to the feasibility of hydraulic lift locks on the Trent Canal. Mr Rogers was in charge by the Government of the construction of both hydraulic lift locks.

In the year 1907 the Government decided to finish the northern outlet of the Canal. Accordingly in August of that year the last contract on the Canada-Rice Lake Division was let. The work on this Division is dealt with elsewhere.

A Toronto View in 1867

It has been reciprocal pleasure that the Trent Canal scheme has at times received very fine support from a certain section of the Canadian press. The Herald of St. Thos' Canal Society has so repeatedly true regarding the press of the City of Toronto. It must, however, be noted in all fairness to the press of the previous generation that a more friendly interest has been displayed in its present during the past few years. That at least one former daily paper had little faith in the various schemes of Hennah navigation as late as the year 1867 may be seen from the following editorial from the Toronto Mail of October 1 (1) at the time:

The memorandum that a committee has been appointed by the Dominion Government to enquire into the advisability of proceeding with the construction of the Trent Valley Canal suggests the fact that that great build undertaking has entered on a new phase of existence somewhat unexpected before. The Canal was proposed in the year 1833 to be, therefore, after thirty-one years of discussion regarding it, for it has been talked about at every election for the Legislature, how examined the question to make sure the public money was not being misspent (1). Dalzy however may not be found to the enterprise. Canal projects die hard, as witness the struggles of the Welland and Georgian Canal. However there was a habit of receiving him when (1) it suggested that has been his case. The Nantyr Canal, for example was proposed in the year 1797 interrupted by a rapid and varied and while, or thereabouts while, though nevertheless supposed the enterprise had collected a number ten suddenly let for its construction. It was pronounced still much in the political adventure of the Governance of this and it now an accomplished fact

The original Trent Valley Canal proposition was not an extensive a measure as that of to-day. The idea of its projector was merely to furnish a route by which from Lake Ontario to Lake Simcoe. The region in the neighborhood of Lake Simcoe was the finest part of that period and people were anxious to open it up to settlement and for which a trust for of $ 1,000 that the Canal was reported on by an Engineer and it was then declared that not million dollars would complete it. It was at once considered an extravagant idea that would cost anywhere near $37. For two years questions proceeded vigorously (2) $200 however finer than a sentiment to the money market during which the cash borrowed by the Canal was devoted to other purposes, and so... result the contractors abandoned the work. In about an attempt was made to revive interest in the scheme and to enlarge it so that it might provide a through passage of vessels from Lake Ontario to the Georgian Bay. But the board of Works reported that as a through line the Canal would not be successful ... owing to the great inshore required and the limited depth of water at certain which would for the most part put that for purposes of local traffic it would not be a success, because the route, through its greater part, was extremely circuitous. The estimated cost of the Canal was placed at $10,000,000 (3) and it was suggested that instead of making it of the dimensions already intended it should be completed and used as timber slides. The plan was adopted at the cost of the work up to the year 1 Confederation was $700,000 (3). From Confederation time (3) has been favourable to previous successive Governments but it would Trent Canal to practicable. The first Conservative Government took this which as the project and the Mackenzie Government after an effort to take over and complete the works that failed ... passed the whole plan into ... hands, them and others, over to the Ca ada Government. The transfer having been accomplished just two days before the Mowat Government went out it was claimed that the effect was to destroy the Canal, remove several thousands of acres ... from which had been reimposed for years, and as fulfilment of a campaign promise, distribute ... lands through the Ontario newspapers among certain favourites in the various constituencies along the rou t. This accomplice was shortly denied, and it was stated very plainly that the works then

passed over in Canada because they were mostly foolish affairs, and because the Government had resolved not to complicate them with a view to the establishment of a through system of navigation.

In 1879 the Dominion re-assumed the works, and it has been still. The authorities have from time to time expressed opinions and adopted measures which have led the residents of the Upper Valley district to believe that the Government seriously intends to tackle the Canal. In the 1882 election one leading plank Conservatives in Central Ontario occasion but it did it was less potent not because the Conservatives had altered their plan, but because the leading candidates professed to be as desirous as any parties could be that, despite the opposers, the Canal should be built. In future contests, the politicians in the district through which the projected work will pass will no doubt vie with each other in their pledges of devotion to the interests of the Canal. The result will be like the myth, all his friend upon the party leaders, although it is known a numbered that some of these opposers of it

Trenton

The Present State of Canal

At the date of the publication of this work, the extent of the finished portion of the Trent Canal is still under the distance from Waterloo, but suffers above Orillia, at Healey's Falls, now available for navigation by vessels of 9½ feet draft. There is however a necessity to lift a considerable to and of inward navigation for the draft maintained by what side ships might be taken, such as to the picturesque head of Harris on Kawartha Lake on the western side of Lake Simcoe on Jackson's Point on the south shore of Lake Simcoe as to Lindsay on the Scugog River, particularly further down the stream to Port Perry on Scugog Lake.

After more than seventy years of it abandonment under a new name as the Trent Canal, as a means of through transportation from Georgian Bay to Lake Ontario, will be no accomplished fact within the next four or five years. At the present time, in engineering circles in Ottawa it is a matter of fact, only regarded as extremely probable that several of the above mentioned contracts there are seven to be let for bidding by the end of the present year. The contract for the erection of Clark's on the outlet of Campbellford which has been awarded to Messrs. Heney Quinlan & Robertson. In the hydraulic engineering on this division, and it may be over seven years yet before it is completed, and before boats may be able to travel from the head-locked centre of Lake Simcoe to the inland reserves of Lake Ontario.

It should be mentioned also that the locks, new under construction on the Rideau navigating from Trenton to Healey's Falls, and in fact extending up to Peterborough, are being built upon a system for a 9 ft. 6 inch draft. This will accommodate barges of 1000 tons. It is intended that ultimately the entire Canal will be deepened to accommodate vessels drawing 9 ft. 6 inches of water with a minimum depth of nine feet between the locks.

However, even with the completion of it, such as present under contract between Peterborough and Toronto through as system will not be finished from Georgian Bay to Lake Ontario. There is yet to be placed under contract the locked extending from Lake Simcoe to Georgian Bay a distance via the Severn River of 32 miles. The work as to the section of the Canal is now considered very heavy consisting of the building of five to six locks and dams. The extension of the early completion of the Trent Canal are hopeful that the Government may place the entire system under contract within the next twelve months, so that it may be finished concurrently with the Rideau Peterborough Division officially known as the Ottawa-Rideau Lake Division thereby completing within the next few years, a Canal deep will afford water route from South Bay Barrie to Georgian Bay for 250 miles this side by the Welland Canal

The Ontario-Rice Lake Division

In the annual report of the Department of Railways and Canals for the year ending March 31 1912 being the latest annual report of R. J. Butchers as head, is found some very interesting information concerning the nature of the work, by its new of progress it making the Trent Valley canal for example of 4 feet 6 inches draft now completing the southern portion of the Canal. Mr A. J. Grant Superintending Engineer who is in charge of the work, says:

This division embraces the Ontario and a half miles of all river reaches between Trenton on Lake Ontario and Rice Lake which will comprise three completed, slack and a half miles of canal, thirteen miles of submersible channel, and thirty four miles of deep river where river improvement will be about 800 feet. The river between entrance has water level of Lake Ontario and normal navigation level of Rice Lake of 369 feet, eight rise will be overcome by 11 locks and varying from 8 to 18 feet in height. Fourteen concrete dams with ungated will be required for the regulation of the river, and at them 75 000 H p gross water rapacities to developed ; the low water stage of the river not be normally used for commercial steamships by a large expenditure in soft rock excavation. The normal navigation level of the restored reaches of the river and Rice Lake 9 ft as then at ordinary summer level, so that your ideally no damage will be done by flooding the land along the river and lake shores. A the reaches the depth will be three or as much 5 feet is practical which, in the majority of cases, will be more than six may of the river banks. The canals and channels with sides sloping also on water and have a maximum bottom width of 80 feet, except in two cases of short canals above Healy falls where the bottom width and has only 50 feet like the submerged channels. will have a minimum bottom width of 100 feet widths and be confined at frequent intervals by steel piles. The canals and submerging channels will have a depth of 9 feet

"There will be eleven lift locks, two of which will be for highways and six for railroad. The will of be using to flexible speed except four for the main line of the Grand Trunk Railway at Trenton Junction, which will be a triple bowel Steel bridge, under which there will be a clear head room of 27 feet in a range of which vessel to Lake Ontario.

"The locks will be of concrete and will have 6 feet 6 inches of water on the sills, also chambers 33 feet wide by 178 feet long between bottom gates. They will accommodate barges of 1,000 tons, whose also will be about 200 feet long by 20 feet beam, and drawing 8 feet of water. Entrance piers of not less than 35 feet a length will be provided above and below each lock. The locks will be filled through will and 4 feet wide by 5 feet high in also walls, which will be equipped with wagon val ns not controlling the water. The lock gates will be of the solid timber type and the upper gates of all canal will be set on the top of levels. They will be operated by steam in two working in local power whether not in remote water will be formed in the form 3 ells

The most part of the improvement of this part of the Trent Navigation will consist of about 30 340 000, the first item for which was made by Parliament during the session of 1907. The project involves the removal of about one and a half million cubic yards of earth rock and 4 quarter million cubic yards of stone and mass rock, and the building of about four and four thousand cubic yards of concrete "

Explosives

As to The Future

THE advocates of the construction of the Trent Canal, as a means of inland navigation from Lake Huron to Lake Ontario, are to-day more than ever convinced that when the waterway is completed it will be an important factor in the great carrying trade between the great west and the Atlantic seaboard. While it has, up until a few years ago, remained very little engaged from the large industrial centres of Canada the obstacle upon its route and which were not definite any immediate benefit from its completion, it is an undoubted fact that the interests of what undoubtedly and transport eminently generally speak, have in many instances of great importance to the foundation of Canada. The present Premier of Ontario, Sir Henry and Castle, Mr. Graham has always been favorable to the project and the work of completing the waterway has proceeded under his administration, with greater vigour than at all times in the history of the country. Another of the prime ministers of Canada, Sir John Thompson, has been more or less hostile towards the project, the cause was here for many years unfavorably to its being completed, but he himself has a free home from any one merges, before the public from the great West, passing down its course.

The old Erie Canal [illegible] is no doubt of slightly more than five feet, one nearly in the time as of carrying capacity, but compared with the Trent Canal, with its depth of 9 feet 6 inches, per the advantages of the Trent waterway quite with pride at the part the Erie Canal has played in the transportation of grain of the United States. It is pointed out that the inestimable benefits which have been accrued from the Erie Canal in the past are not disputed by any one. To it more than to any other one cause, is due the phenomenal growth and unsurpassed supremacy of the City and State of New York. It opened up the great West to settlement, and in turn attracted to produce of the West at the low rates then through the Appalachian chain, which rates were at an State of New York. The tolls on all waterway have since been repaid the cost of construction, maintenance and operation in addition. It has paid over $200,000,000 to the State treasury within the limits of the State, and the still greater sum of $600,000,000 to the treasuries of the State and the great trading cities, from Boston to Albany, thereby a continued list of commercial centres, which has no counterpart in any other State. The growth of these Canals as here laid in the construction of railways paralleling the Canal and these by consolidation and scientific management have practically reduced the cost of transportation, so that the advantage which a waterway necessarily brings. With the completion of the Trent Canal can not only enjoy transportation rates generally be reduced, a point along its route but a good percentage of the grain that passes through the "Soo" Canal, in its way from the West will be intercepted in barges by way of the Trent to Montreal and the seaboard

One of the silliest cases that has ever been dedicated at the practicability and desirability of the Trent Canal and its possibilities as a factor in through transportation was given by Sir R. J. Pl [illegible] who some less years ago represented West Peterborough in the Provincial House of Commons. Sir Hugh, who said great that Trent Canal and its future a most useful study in addressing the House at his former opponent on things, said

The consumption of coal at the City of Peterborough last year was 43,000 tons. The rate at coal from Soapsuckers Bridge to Peterborough by rail is $1.25 a ton. Coal is delivered in Chicago at 5 cents a ton transportation Bridge [illegible] Freight between Cayuga and Toronto or Port Hope is 25 cents a ton, and the rate between Port Hope and Peterborough, by rail though only a distance of 50 miles, is 80 cents a ton. The coal about the freight from Toronto to Peterborough, were the Canal completed would not be more

that 3¢ cents per ton. On that basis there would be a clear saving on coal at Peterborough of 75 cents a ton or, on the amount consumed last year a total saving of $12,000.

After detailing very exhaustively a la the position Mr Hall concluded by saying:

When you take into consideration the fact that we have the cheapest right in the very heart of the Province of Ontario of consolidation a 270 ton barge Canal which will have a capacity of carrying practically two and a half wide fields of grain from Midland to Norwood (and you will admit that it is a matter deserving of the most serious consideration, and that the Canal is a work which should be immediately gone on with as part of our national system of canal communication

It will be observed that Mr Hall referred to the Trent Canal as a 270 ton barge waterway. Since the time the Government decided on making the new sections of the Canal with a depth of at least 8 inches on the locksills, thereby providing for the use of 1 000 ton barges. The Ontario Hon Lake section of the Canal is being built with as at least 4 inches draft, and any renewals that may be made from time to time on the older portions of the Canal will be on the same scale.

As To Power Development

The Trent Canal as a product of electrical power is doing much towards the industrial development of the district of the province of Ontario. Enquiry spreading, the various dams along the line of the Trent Canal from Lake Simcoe to Trenton are capable of developing 100,000 electrical h.p. Of course all the dams are not at the present time equipped for the reason that the district is not as yet able to handle all the power that is to right. However, the demand is rapidly increasing and now those along the canal are each year being developed, and the figures and prices for many value electric factors are being acquired which light and power as at low rates as the Niagara district, which is supposed to have the cheapest light and power in the province.

Every one thinks water power along the route of the Canal while one or two enquiries have been adressed either by municipalities, or by private companies. The ownership of these powers was acquired many years ago, and as surrounding the canal riparian rights were a matter that gave the Government considerable difficulty. However all matters of this kind are now adjusted and while the Government does not reserve a definite limit, all the water powers on the Canal, certain dams however which were taken over by the Government and improved, are on power purchases in so far as the Government is concerned. The terms granted for the use by the power companies of the regular water after the payment of compulsion is a mere nominal. In a statement that the returns for regular water at various dams will annual fully developed, yield a revenue to the Government of thirty or twenty thousand dollars per year.

The following tables give the location of dam-sites, with their respective flow and hydraulic power, for the year of the Canal:

FROM LAKE ONTARIO TO SIDE LAKE

	H. P
DAM No. 1—At outlet from Trenton Reservoir, 27 ft. head. A necessary low dam of Lake Ontario—head of 27.0 ft. can be formed. With 1,713 ft. head, the amount of h.p. developed is	5,377
DAM No. 2—At Glen Miller, 1.6 miles from Trenton. A 10 ft. head can be developed with a low earth fill across the Trent Valley.	2,345
DAM No. 3—At Glen Miller, 1.6 miles from Trenton. A 10 ft. head can be developed with a low earth fill across the Trent Valley.	2,345
DAM No. 4—2.5 miles from Trenton, having a head of 15 ft.	2,137
DAM No. 5—2.8 miles from Trenton, having a head of 16 ft.	4,560
DAM No. 6—3.4 miles from Trenton, having a head of 36 ft.	4,494
DAM No. 7—At Glen Ross, 4.2 miles from Trenton. A large impoundment of water; a head of 8 ft. at this dam can be increased. A 6 ft. head would produce	1,828
DAM No. 8—At Glen Ross, 4.2 miles from Trenton. A large impoundment of water; a head of 8 ft. at this dam can be increased. A 6 ft. head would produce	1,828
DAM No. 9—At the foot of Myer's Island, 20.4 miles from Trenton. A 20 ft. head can be developed. A dam for the impounding of about 20,000 cubic yards of rock for a reservoir and a 20 ft. head can be obtained at. ..still greater can be obtained across Myer's Island. There is a 20 ft. head to be obtained at the foot of Myer's Island. A 20 ft. head would give	8,688
DAM No. 10—At head of Myer's Island. There is room in local excavation without any expense to increase excavation. This considerable volume necessary will. head can be obtained, which would develop	1,644
DAM No. 11—At Hunters' Falls, 24.6 miles Campbellford and 28.8 miles above the town of Trenton. A 28 ft. head on a system of development at the vicinity of Lock No. 18	10,888
DAM No. 12—Known as Stephen's Rapids, just above the Town of Campbellford. This power to this point is developed by the Seymour Power Company. There is head at this point of 31 ft. Amount of power developed	9,868

Page three

DAM No. 10—At foot of Crow Bay. This power is developed by the Municipality of the Town of Campbellford. The head is 28 ft. Power developed is

DAM No. 11—At Healey's Falls, 2 miles below the Village of Hastings. A head of 75 ft. can be obtained at this site by the construction of considerable dams in various directions. This is considered the most valuable water power on the trunk river between Trenton and Peterborough. The power is developed by the Hastings Power Company limited. It is all transmitted for, while 17,280 is used locally

DAM No. 12—At Hastings, owned and developed by the Peterborough Canoe Company. The head of 8 ft., which is largely reduced during the high water season. A 6 ft. head will give

1,200

Total amount of h. p. available between Lake Scugog and Rice Lake

14,480

The flow of the Trent River from below Healey's Falls to Trenton is estimated at 1,000,000 cubic feet per minute. At Healey's Falls and Hastings the flow of the river is estimated at 600,000 cubic feet per minute.

FROM RICE LAKE TO STONY LAKE

DAM AT LOWER, just below the City of Peterborough. The dam is now developed. It has a head of 8 ft. at low water, but during the high water season this amount is increased from the tail-race to 12 feet or more. However, it would not be considered, this among the first of the years to obtain extra horse power, the amount of power available would be

2,000

DAM AT LOCKS STREET Peterborough, owned and developed by the Peterborough Canadian Power Company. This Company has contracted

2,000

DAM AT ASHBURNHAM owned and developed by the Peterborough Light and Power Company. The Power Power Company, Limited

2,000

DAM NUMBER 44 IN CHEMONG, built just above City of Peterborough owned and developed by the City of Peterborough

2,000

HAVELOCK DAM owned and developed by the Canadian General Electric Company

1,000

DAM No. 1 Buckhorn Lake fall known, located in and developed by the Canadian Power Company. This dam, along with No. 2, is part of the dam about the locality

1,500

DAM No. 2—Owned by and developed by the Canadian Power Company

1,500

DAM No. 3—Owned and developed by The Bridge Company, of Peterborough

1,000

DAM AT YOUNG'S POINT—Owned and developed by the Canada Cement Company

500

Total h. p. on this system

16,500

In the analysis of the amount of available power at this station, the figures furnished by the Ontario Hydro-Electric Commission are used, with the exception of the estimate on the dams just below the City of Peterborough and the Young's Point Dam. The Hydro-Electric Commission's estimate on the dams from Peterborough to Lakefield is considered to be very conservative; the flow of the river being estimated at 50,000 cubic feet per minute. It is more generally conceded that the best water flow of the river from Clear Lake to Rice Lake is 80,000 cubic feet per minute.

FROM STONY LAKE TO CAMERON LAKE

DAM AT STONY LAKE—Owned by and developed by the Canadian Power Company. There is a head of 12 ft. Taking the flow of the river at 80,000 cubic feet per minute the amount of power that may be developed will be

1,440

BOTTOM DAM—Owned by the Canada Power Company. Not yet developed. A head of 12 ft. Taking the flow of the river at 80,000 cubic feet per minute, the amount of power available would be

1,440

BOBCAYGEON DAM—Below the foot of the dam is 70,000 cubic feet per minute, with a 12 ft. head, the amount of power available is

1,200

FISHER'S RAPIDS DAM. The surplus water at this dam is not yet fully developed by the Canada Power Company. The head is 12 ft. and the flow is 80 ft. per foot. The amount of power undeveloped is 12,000 horse power. At the outlet of Pigeon Lake, about 18 h. p. on this section therefore is

12,000

1000

Few people realize that the 100,000 electrical h. p. capable of being developed along the Trent Canal from Balsam Lake to Trenton, is equal to 1,600,000 tons of coal for which we are paying the United States four million dollars annually.

The 100,000 electrical h. p. above mentioned is but little more than the power developed on the Niagara River within forty feet from Lake Ontario to Georgian Bay

Twenty-four

As a Tourist Resort

THE resort of the Great Canal contains at a check of lakes and rivers amongst on the Continent in their varied characteristics is hardly matched. It is only within recent years that these picturesque waters have been conveniently reached by the tourist, being advantageously to tourist resorts, but to-day it can be set one available part or other on the lakes and rivers through-out the entire region; but it was indeed with pretty amongst human less considerable towns, numerous of almost exclusively for the tourist trade. The growth of popularity of these waters, as an ideal spot to spend the summer months, has been very interesting and we are here not considering a degree of advertising by railway companies and to but given the small dollar established but to more attractive resorts, such as the Thousand Islands and Muskoka.

A certain section of the Great Canal is commonly known as the Kawartha Lakes. Kawartha is the Indian word for Bright Waters and Happy Lands. They comprise fourteen beautiful sizes—Scugog, Sturgeon, Cameron, Balsam, Pigeon, Sally, Sixth Inner, Chemong, Deer, Loon-lak, Stony, Clear and Pemidjewanagog—to which may also be added Rice Lake, on into one radius about the Otonabee River town of Peterborough.

The attitude in these famous lakes from other traditional shores for its tourist and pleasure another mass of less lively, 250 feet above sea level were 200 feet higher than Lake Ontario and 300 less higher than Georgian Bay. On these charming is not the pleasure number of land delightfully and, wooded shores and sandy beaches, where bathing may be indulged in with safety.

The communications for excursions to the various points on these waters is much superior to the average summer resort. For those who wish to visit it I hardly for to coming, the journey is come on the shores to have a variety different to reach the Kawartha Lakes. The headquarters of which, as shown and the many beautiful of the Kawartha Lakes specially kind Peterborough, in the engagement of a summer sojourn. The Kawartha Lakes form the first of the great Canal are linked together by narrower here and there in, which show this kind of the pleasure boats to a pass from one to another until the whole chain is explored. The river navigation is many of our navies before the connecting of locks the passage of a lock or the "locking of it," however, is sometimes even a very prompt. The day of an ordinary steamer has outside one hour of a night or by way of a prize vessel is enough to bring it from another to the Kawartha, passenger into low

The Highland Lakes of Ontario are like and are smaller, the South Lake. That the are possess to north grandeur of these I feel inclined now no such suggestions of some of the Canada lakes but these, as above there are impressive more a vision have the world, with every point and island, every bay has localized place, with a to many picturesque beauty. Every promising, however passage historical romantic-name lends, the meaning of a lake, and evidently being have every bound to point of water whose continuous shores seem to have a name for her hidden locked more islanded and or profusion, bounded we the found a passage leading through more a labyrinth of beautiful scenery and just a hundred progress never impossible rather wanderer one breath or six of it.

Local a name the Kawartha Lakes when Nature displayed there to advantage by here of undoubted interest of Samuel de Champlain here in Indian often, yet some with all this Nature then did. Improved by the certain those of them are simply enchanting. Travellers in Scotland, to readers of Sir Walter Scott's of this Kawartha world of The Beauty Highlands. are not acquainted with the wild grandeur of the Scotch lochs, and all this acquaintance is reproduced within the environs of the Kawartha Lakes. The more the scenery is studied the more convinced one becomes that the charms which are spread out before it Canadian lay out the who are most lovely which are scattered under famous climate. The absence of geology the beauties, has the immense photographer and field and waters while in the Kawartha scenery

As for the remainder is in without district of Canada is now local accordance network of lakes travelling to figure four less the steamers or in many by the unfathomable here of the cabins have for one both—the same in the dispose of the voyager

The Hydraulic Lift Locks

In connexion with another big hydraulic lift locks on the Trent Canal, we can see no better time to reproduce a few notices from a paper presented by Mr. W. Jas. J. Francis C.E. The other Mr. Chas. Geo. C.E. Mr. Francis, as in three of the construction of these locks, was at all varieties of the Engineers of Pittsburgh, and Canada, and had the honour to preside at the York in January, 1870. Mr. Francis read a paper to the annual meeting of the Canadian Society of Civil Engineers at Toronto, the subject being Hydraulic Locks in Canada. While space will not permit of our using the details in his ordinary and hoped that the common sense observations and published before will give the reader some slight idea, at least of the hydraulic lift locks on the Trent Canal. Mr. Francis said as per:

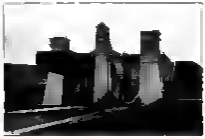
Built for the Canadian Government, by Canadian contractors, under the direction of Canadian engineers, the hydraulic locks on the Trent Canal may properly claim the title, Made in Canada. In view of the fact that the Government commission the treasury completed a high lands lift at Peterborough, and that the United States Government the same, it would surely of the problem of mechanical lifts in connexion with the reconstruction of the Canadian canals, a detailed description of the Canadian hydraulic locks may be considered appropriate at the present time.

"The larger of the two Canadian locks is situated on the Trent Canal within five miles of the navigation of the city of Peterboro, and the town in operation since 1896. The other lock near the village of Bridgenorth, after a period of many years, Rideau Lake and Lake Simcoe.

"The hydraulic lock of theoretically an admirable machine and of designed at once the place of ordinary locks where a great difference of level or level in a short distance. Besides the Peterborough and Bridgenorth locks there are three other locks of this type in operation, one being in England, another in Belgium, and the third in France. The English lock the least in combination has for over thirty years, while those in France the Belgium have been completed about twelve years. They all have a lift of about fifty feet. The depth of water in the French and Belgian locks of 7 feet 6 inches, and the lock chambers are 40 feet long and nineteen feet wide. Several vessels having similar dimensions are now being built for the Belgian Government. The chief dimensions of the Peterborough Lock are 65 feet lift, chambers 142 feet long, with 34 feet clear width, and 9 feet 6 inches depth of water. The Bridgenorth lock has the same general dimensions with a lift of 50 feet and is to contain over a Pre Peterborough lock the water used in double that of the ordinary European ones, while the height of the lift of necessary over fifty per cent.

In principle the hydraulic lock may be likened to two immense hydraulic elevators of the simple single type, having their rooms connected together so that the descent of the one causes the rise of the other. In place of the ordinary elevator platform we have a large water-tight box of lock closed at either end by a gate. The bottom of pedestal is resting on the vessel can float but of water and then raising the gate on the end of the box, as well as that at the lift of the canal that having the box independent of the canal the lock is now complete. The box with the water and the floating vessel is then raised or lowered to the other canal. The chamber at the above of exterior attached with a few inches more water than the other pressure that giving of the necessary additional head to discharge at or else 6 to open the vessel of the water when water communication is established between the two ponds. The construction of the Canadian locks varies materially from those of Europe, and as far as vertical appearance goes, there is little similarity. The departures are largely due to the climatic conditions for at the Atlantic proposed adopted by abandoned the European engineers in most instances.

The purposes of detailed description the Peterborough lock will be taken first and the of Rideau in the Kirkfield structure will be used later in the paper.



A general view was exhibited for the site of the Peterborough lock, and the excavation was completed in 1904. The hauling line chosen at first for moving depth of excavation was about 40 feet, and the material thus obtained was used in building embankments to carry the level of the upper reach at the back of the structure. The concreted material was found to be hard clay mixed with small stones and boulders, underlying a thin layer of fissile soil. At the upper end of the excavation a small amount of limestone was encountered, but below this it was limestone rock. The rock was in layers of from 12 inch to 6 inches in thickness, thickness with trace blends layers of clay and shaly material. The layers of crystalline limestone stood the weather quite well, but the shaly parts disintegrate very rapidly under the action of rain and frost. The excavation at which rock was found was considerably between, being practically at the bottom of the pit. When this rock was found it had been run free of excavation towards the floor to be proper grade. No feelings were exhibited under any of the walls, all being built upon the solid rock.

After deciding in detail with the main sides of the given walls in which the large pressure named Mr. Francis' paper gives a description of the substructure of the lock. It is built entirely of concrete and contains 1 little over 38,000 cubic yards. The lowest wall in every lock block and on that high the length being 120 feet at its base. The lowest, dense of concrete are the same structural curves lock at the walls. In round numbers, the solid length of each lower lock reach measures 250 by 1750 feet.

The earth embankments upon which the canal is carried up at the back of the lower wall was built in layers under in addition, thoroughly compacted by rolling and leveling as they came up. This method proved very satisfactory having the embankments to be settlement of only about 1 foot in a period of nearly a year when the depth of made earth was upwards of forty feet.

The contract for the embankments and substructure was executed by Messrs. Carry & Lavender of Ottawa, and completed in 1907.

Dealing with the superstructure, in Francis says —

The superstructure of the Peterborough lock was built by the Dominion Bridge Company, of Montreal. The work was commenced in the summer of 1905, and the structure was completed early in July 1904. The cost of the superstructure complete was $264,000.00.

Each of the lock chambers is 30 feet x 65 feet, with lifted 8 inches of plating on the sides. These chambers, with the exception of the ends of water were fixed to one common mass foundation. It is also necessary that a clear headway of 60 feet be left above the water level. The depth of water for which the lock is constructed works in ordinary navigation however, to be called 9 feet on the sill. The head of water which each of the lock chambers contains is 1 300 tons, and this is also maximum and which it is necessary to provide for when a floating vessel displaces only but even weight of water.

The structural steel work was extensively described by Mr Francis, as well as the gates and lock mechanism, and the main pressure and rules. After machinery and boilers erection, all the castings of the frames were subjected to a rigid hydraulic test, of 6 pounds of 1 200 the gate reports lock, being similar the working pressures.

As to the materials and general appearance Mr. Francis says—

A summary of the materials and various kinds of steel used in the superstructure is as follows—Rolled steel, 31 plates and shapes for the lock chambers and gates, 500,000 lbs; cast iron, 2 cranes, counterbalance guides, and various machines 600,000 lbs; steel castings for the main gearing and counterweight 400,000 lbs.

Care has been taken throughout to make the general appearance of the work as attractive as possible. All the walls and underways are protected by masonry mounted railings, and the windows and doorways are closed by ornamental grille-work. The lockmaster's cabin on

the top of the centre basin of concentrated oil materials as high as the visible ship. Above this the mud floats west of harrad with weed, and the whole of the counter screened with copper. The breeder is finished in British Columbia items of the natural colour.

Many people who visit the hydraulic life baths and the items of operation can be first proposed to know how the upon between the back chamber and the frame of the three arm of three water-slide Mr Francis requires this, does

There are a space of nearly 2 miles between either end of the back chamber and the frame of the trunk pipe. When old dashed to examine the back chamber with a three tube diagram, some the to be stored. This at there by having metallurgical rubber pipes fastened to the frame of the trunk pipe and arranged so as to fit the When the back chamber is in position for the commissioner, the rubber tube of filtered with air is dried. It passes per readers from pressure, which causes it to expand and press against the roof of the chamber.

The operation of the hydraulic ball requires from one—a labourer and the contractor to process. The labourer of a charge and is responsible for the entrance. Two gaseous are supplied into a the lower end of the labor in the upper as were and claim the pipe is below on the and the and tubes and to operate the counters. The inventor pipe into charge of wheels to about 300 feet on either side of the bell. The labourer during operation, stays at his end on the top of the centre lower rail but he views of all that happens. He is also in communication with his two assistants by a small signal system. The labourer has two keys into the principal house, and through an intersecting system regulates the working of the bell. The other by controlling the gas engine and the operator and the one by the rail immediately above the respective manholes, constitute an access to the gasholder. The inner-looking system is so arranged that the labourer must not leave his work before the wrong steps having made an entirely in use of gaseous air or by using their letters in the wrong steps.

A writer of not a other time, of the reception inside of apparatus, he no accurate does built the of counters are done in the lower level, empty in flow one to the and of winter of three and of decided to prepare about for and plate protection. The lighter must it with of six pressure and of the and and in filled with water. The metal valve on the ascending pipe will be closed and water will be pumped into one of the pressure well by the gas, until an superintendent chamber rises to the level of the upper tunnel. As the chamber of the room will show that this necessary that the apparatus chamber, of cross case. small be side of descending to move the other to side the full powers system, must sounds, a volume of water passes from the sinking chamber carried on. This other contents of equal to by volume of rest of the upper, time the charge that tells pass during the window section of the chambers in that the that the hydraulic chamber business, necessarily historical, 'it of the other particulars. of other words, the descending chamber of using weight within the ascending of consumers pressure chamber of of was necessary that more water weight be provided to be overcome the friction of the gasket and of the sinking force of the counterpoise. The area of each inch chamber of the gross and pressure only no additional depth of and certain to give an more load of water of 60 tons, which of sufficient for ordinary operation. The addition of a weight of of course of to the effective of accelerating by free of the relative change of position to the chambers. The only level of introducing, in the chamber through the whole elevation is about two minutes. But this will depend upon the refinement of the main grinder and supply of the pumped of the gasket, and the manipulation of the main valve of the levers of the instrument.

An ordinary boiling, is concluded in this manner. Suppose with rate of experience, has later found to get sufficient additional weight in the descending chamber. The apparatus chamber will then be required to stop with its face the well tackle lower than the bottom of the upper work. On communication being established with the work advanced into the room the main steel into the lower chamber contents, assuming the depth of both readers to be the water. Then the used materials to under the building. the time satisfying the contract and

opened and the seal valves are lifted, thereby admitting the vessel into the chamber and causing her three masters, causing the gates, defining the seal space, and opening the inlet valves between the pressure. The hoisting chamber then commences to descend the motion being allowed to increase gradually by the gradual opening of the valve stem to counter the resistance speed. At about three-quarters of the stroke the angle valve is slowly closed communication between the pressure being varying the all vessel due end of the journey is reached. The change in elevation being made, the seal valves are lifted the gates are opened and the vessel or vessels are free to go on their journey, after being towed out by the engineer. The passenger continues in the descending chamber shortly forty one into the lower vessel, while another vessels to perform the next voyage of ascension are also chamber which has just reached the higher elevation

The vessel lockage, as for in the Peterborough lock, is 65 ft. 6 in., being the whole distance from the sleeping of the vessel of the lower vessel or her proceeding of her journey while her own vessel in the upper one

The Reservoir Waters

THE Trent Canal district may be said to have blossomed on January the first as regards Reservoirs—for the value of its 20 reservoirs-to-be. While the Trent Canal has been heard of for many years, and has, in the way of Britain's navy, perforce dwindled as to which perhaps most of the great political parties have played, it is, in the same vein, a small a waterway for commercial purposes, all the products in the country that it has been advocated and to which it has evidently been exhorted. This waterway which when completed will run through one hundred counties of Canada, connecting Georgian Bay with Lake Ontario, at Trenton, some 240 miles in length, is in fact 7 inches deeper fully 200 miles shorter to Montreal than by the Welland Canal is in really passing comparison. It will, therefore, be a matter of a short time only until the difference of this count will be made up and it will be demonstrated to the world if they can that the Trent Canal projected nearly 75 years ago, can carry goods from Holland to Montreal in cheaper rates and in better time than by the Welland route.

However it is not along this fact that a new gang is about to descend the Trent Canal, the eastern of means by which shipping may be developed along its route, for the Hydro-Electric is playing is its powerful development of its district. Next to Sir Rodgers, there is no district in other Ontario as true, it which the water falls are being developed to more degrees than along the line of the Trent Canal. There has been a number of rivers developed along the line of the Trent Canal, in which power has been at a limited amount has been at its waterfall for many years past, but heretofore even the great possibilities in power development on the Trent Canal have been fully realized. Hitherto and before power houses are now handing up at the various dams, the new district consolidated is increased a ten-year, in power transmission lines.

This is also by no means modern. Flesher, it might be noted that the first schedules for the route the Canal should take at certain points, and the services is substantial now into the route the Canal should take at certain points, and the services is substantial now into effect from by the Engineers throughout the Canal provinces, many many valuable sites were seen by the Engineers throughout the Canal. Those dams are, in the present time, practically available for the development, a power. Those dams are, in the present time, practically available for the development, a power. Those dams are, in the present time, practically available for the development, a power

Until five years ago, the waters of the Trent Canal and the waters of river it traverse as the Trent Canal watershed were under separate management. That is the mills lakes and rivers that constitute the Trent Canal proper were under the control and management of the Dominion Government which the inhabitants were under the control of the Government of the Province of Ontario.

From the terms in mind that the District of Muskoka and Rosa portions of the counties of Peterborough and Victoria north of the main line of the Canal, contain almost numerous lakes of various depths and sizes. A glance at a map shows on a reasonably large scale, on which these lakes are shown, would undoubtedly surprise one who is not personally familiar with the locality. Some of these lakes are quite large. Balsams, for instance, in the town ship of Smith-Ennismore-Lakefield is 2,048 acres; Kawartha, in the township of Harvard having an area of 3,833 acres; and Clear Lake, in the township of Lutterworth, having an area of 2,716 acres. These lakes nearly all have considerable areas that feeds discharge into Trent Canal. This two of the largest of these are known as the Otal River which flows into Balsam Lake at Coboconk and the Burnt River which flows into Cameron Lake, near Bobcaygeon.

Inasmuch these are other streams that are valuable on account on the Trent Canal, a list of which, together with the areas, as shown on their basins is as follows:

ACRES	ACRES
Gull River basin	99,584	Deer Bay Creek basin	2,947
Burnt River basin	22,000	Smith's Creek basin	905
Maple Creek basin	871	Stony River basin	34
Shadowagan basin	811	Jack's Creek basin	1,988
Rice's Creek basin	1,863		
		Total	131,2

The above are exclusive of the Otter Lake waters, which empty into the Trent River below Hastie's Falls. Other key waters are still under the control of the Ontario Government.

During the year the new regulations was passed by the power users along the Trent Canal, as well as by the navigation interests as have the control of lower-mentioned is incident to the new system of storing on the respective waters mentioned from the watershed of Dominion to the Executive Government, in order that there might be larger be a dual system of superintendence in connection with the water that flows through the Crowe-bay and Trent rivers on the route from the Canal. Until now that the natural flow of the Crowe-bay River at Fenelon-bay has 60 000 cubic feet per minute. There was an inclusive flow of water for six months that it was practically impossible under the conditions then existing, as proved by

At certain periods of the year—during the spring and early summer—there are large amounts of water over-running down the Crowe-bay and Trent Rivers, which by the control of August there has not enough water to drive the wheels of the various power stations on the Canal, or supply the requirements of the set lessee interests. This time of all this was due to the fact that there no storage of the tributary waters, but no intense volume of these streams rather than to assist the settlement in getting the river into. The Crowe-bay Dominion and Swift makes down in the middle of many of these lakes, which were constructed by the Provincial Department's Public Works. The dams were built and operated in the interests and for the sole benefit of the lumbermen. When the lumbermen would drive out of the various lakes there would be an abundant and unnecessary flow of water down these into the rivers Canal. This step kept would remain low until the following spring when the same process would be gone through

—the argued, and quite properly so that if the entire water of the Trent Canal watershed, together with the water in the main line of the Canal, were placed under one management, in terms of conservation could be maintained effectively without any interference with the rights of the lumbermen, a steady uses lumbermen flow could be made at such times as they may be

Dunsheen and Trent Rivers in all seasons of the year. It was, of course, contended that the owners should be vested in the Dunsheen Conservators in view of the requirements for navigation purposes. After some months of negotiation in which prominent men of the district, regardless of political creed took part the scheme of the Dunsheen Conservators was done in July 1906 the Provisional Conservators handing over all bonus, rents, and arrears whatever to the Trent Canal, north of Peterborough. The Dunsheen Conservators agreed to protect the rights of the landowners in respect of the use of water on these streams, and guaranteed to them all privileges they had hitherto enjoyed.

The Engineers of Railways and Canals, under whose control this splendid waterway now passes, at once got busy. Survey was taken for the repair necessary and knowledge of the dams in the matter of base various levels. The old timber dams were in many instances replaced by substantial concrete structures. Others were repaired and replanked, and in nearly every other case the dams were raised by many feet over their former level. On the natural streams mud, sunkpieces, and superfluous rock were placed in various dry stop-logs of the different dams, and an almost perfect stream was built up. The result of the work in this far drier locality. The water is now conserved in the navigation by Conservator's drives are robust was with care, and by using only what water may be absolutely required. The stop-logs are immediately replaced after each drive passes out, and the water is handled up until such time as it may be required in the lock machine or full records on the main Canal.

The beneficial results are clearly indicated. The low of in River Crowbrow was reversed in 30,000 acres lost per season, being put into the Rideau was five short years ago. Power developments of such class has increased-ups increased that more power is secured by available by distribution throughout the district.

It must be borne in mind that the system is not yet considered on the full basis of its possibilities. Each year more dam reservoir dams are being built, and for some years to come there will be room for still further improvement. An accurate dry total year in some slight excess, as the present greatly increased capacity of the power plants, who there is not a power company operating on the Trent Canal, assisted from Peterborough down east will not say thanks due of water in the Trent Canal has been available more uniform, and 1907 year only greater throughout the entire year than it was 1906 and six years ago.

There is no doubt therefore that water conservation in this district has been responsible to a most surprising degree. There is no doubt also, that the successful working out of this policy has resulted in great industrial growth which is on par in the summer for the reason that many of the best dams of the Trent Canal are only now being harnessed with a view to supplying the very extensive market which awaits it.

It is only fair to say that the success of this scheme is to a very large measure due to the superintendence of the Canal by J. H. McClellan, who has given the matter a thorough study and has established throughout that district of acquaintance with which no water power was secured a year ago.

128,468 Acres of Water

It is worthy of note that the area of the various lakes that form the part of the Trent Canal from Balsam Lake at Trenton is 88,019 acres. To this may be added by way of that is commonly termed the River by Waters all which is 88,338 acres. This, therefore would mean that exclusive of the many lake-like rivers and streams, there is the 448 acres of water flowing continuously down through the Trent This area is made up as follows:

TRIBUTARY WATERS	
	acres
Otch River basin	40,584
Burnt R. at basin	20,958
Naples Creek basin	82
Hastingsburg basin	7,962
Bell's Creek basin	2,868
Squaw River basin	54
	acres
Balsam	2,800
Cameron	8,128
Scugog	9,000
Simcoe	8,200
Pigeon	1,600
Chemong	8,450
Buckhorn	1,980

	acres
Jack's Creek basin	2,139
Crow River basin	16,469
Deer Bay Creek basin	2,527
Hastings Creek basin	653
	98,360
	acres
River Southern to Burleigh and	
Deer Bay	6,469
Stony and Clear	9,87
Rice	3,000
	98,179
Total	98,498

Of course Lakes Simcoe and Couchiching, which are on the List of the Trent Canal, have an area of 268 square miles. These waters however flow through the Severn River into Georgian Bay, and after flowing over Niagara Falls join their neighboring waters of Balsam Lake in the Bay of Quinte

The Crow River basin of 16,469 acres flows into the Trent Canal just below Hastings Falls. The Superintending Engineer of the Canal in his annual report to the Department estimates the low water flow of the Trent River below the point at which the Crow River feeds comes at 2,800 cubic feet per second while at Healey's Falls the low water influence is 500 cubic feet per second

The Charts Explained

In reading the chart of Trent Canal waterways, as shown who may desire in order to the charts herein set down that lines there have been merged in the following order

Chart of Lakes Couchiching and Simcoe

From the entrance to Couchiching Bay Eastward to Balsam Lake on chart is required, the channel following in Talbot River for some distance, and the remainder of the distance being through an artificial canal

2 Chart of Balsam Lake and Cameron Lake.

3 Chart of Sturgeon Lake

4 Chart of Pigeon Lake

5 Chart of Buckhorn Lake and Chemong Lake.

6. Chart of Deer Bay and Lovedell Lake from Southern to Burleigh

Chart of Rice Lake and Crow Lake

The channel from Young's Point to Percyborough through Lake Katchewanooka and the River Ouseburn is easily located without the aid of a chart)

8 Chart of Stoney River and Rice Lake

Height of Locks

The following table gives the names of the locks, & the heights between them, on the Caledonian Canal, together with other information.

No. of Locks	Height between each Lock	Names of the Locks	Height of Top of Lock above Sea Level	Depth of Water on the Sills of the Locks
	ft in		ft in	ft in
	1 0	Seaforth Basin	20 0	20 0
1	8 0		28 0	8 0
2	7 6	Clachnaharry	35 6	7 6
3	8 0		43 6	8 0
4	7 6	Muirtown	51 0	7 6
5	8 0		59 0	8 0
6	7 6	Dochgarroch	66 6	7 6
7	8 0		74 6	8 0
8	7 6	Kirkhill	82 0	7 6
9	8 0		90 0	8 0
10	7 6	Muirtown	97 6	7 6
11	8 0		105 6	8 0
12	7 6	Clunie	113 0	7 6
13	8 0		121 0	8 0
14	7 6	Fairy Landing	128 6	7 6
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25	8 0		214 0	8 0
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546	7 6	Muirtown	4251 6	7 6
547	8 0		4259 6	8 0
548	7 6	Muirtown	4267 0	7 6
549	8 0		4275 0	8 0
550	7 6	Muirtown	4282 6	7 6
551	8 0		4290 6	8 0
552	7 6	Muirtown	4298 0	7 6
553	8 0		4306 0	8 0
554	7 6	Muirtown	4313 6	7 6
555	8 0		4321 6	8 0
556	7 6	Muirtown	4329 0	7 6
557	8 0		4337 0	8 0
558	7 6	Muirtown	4344 6	7 6
559	8 0		4352 6	8 0
560	7 6	Muirtown	4

The following table gives the location of the locks with their respective lifts, after leaving Falcarn Lake and ascending to Lake Hinnor

	LENGTH OF CANAL	DEPTH OF WATER	LIFT
49 Hillfield hydraulic lift, lock No. 2	100 ft.	15 ft	1 ft 50 ft.
50 No. 1 Station-Balsam Lake Division	65 ft.	20 ft	1 ft. 50 ft.
51 No. 2 Steppe-Balsam Lake Division	142 ft.	20 ft	1 ft 17 ft
52 No. 3 Steppe-Balsam Lake Division	142 ft.	20 ft	1 ft. 11 ft
53 No. 4 Steppe-Balsam Lake Division	62 ft.	20 ft	1 ft. 14 ft
54 No. 5 Steppe-Balsam Lake Division	62 ft.	15 ft	1 ft. 1 ft

It will be observed that Lake Hinnor is 134 feet lower than Balsam Lake.

The Cost of Construction

The following table shows, for sections about each year and the total amounts upon the 31st March, 1916, as the Town Clerk (Comptroller) to Capital Account

Government expenditure prior to Confederation	£ 858,977	s. 3	d. 0	£3 907 78
1861	88	16	1	348 978 58
62				1 96,475 78
1863				55 213 3
1864				195 1 63
1865	69,767	1	0	348 583 01
1866	28,583	11	0	384 950 69
1867	31,388	04	1	479,874 65
1868	78,	08	0	823 050 7
1869	79,84	63	1	988 858 64
1870	14,879	05	0	1865 25 5
1871	1,222	13	1	1878 388 40
1872	56,644	10	0	1879 1 2
1873	1,838	02	0	1880 343 28 05
74	1,137	18	0	1881 580,526 26
1875	1,964	07	1	1882 808 020 30
1876	3,118	33	0	
				Total 27,873 171 10

Some Distances

The following table of distances on the Trent Canal may be found both useful and interesting

ON MAIN LINE OF CANAL	miles
Port Severn to Washago, via Severn Bridge	24
Washago to Mercury	10.1
Mercury to Gamebridge	8.0
Gamebridge to Bobcat Lake	0.1
Bobcat Lake to Fenelon Falls	2.2
Kenelon Bridge to Fenelon	4.3
Fenelon to Bobcaygeon	14.3
Bobcaygeon to Buckhorn	10.3
Buckhorn to Burleigh	2.1
Burleigh, to Young's Point	0.0
Young's Point to Lakefield	2.7
Lakefield to Peterborough	0.0
Peterborough to Rice Lake	10.3
Rice Lake to Hastings	8.0
Hastings to Trent Bridge	8.0
Trent Bridge to Healey's Falls	0.2
Healey's Falls to Campbellford	8.2
Campbellford to Glen Ian's	2.0
Glen Ian's to Frankford	9.4
Frankford to Trenton	2.0
ON CRAMAHOBA LAKE	
Stumpy Point to Bellrock	3.5
Crossing to Bobcaygeon	10.75
ON CLEAR AND STONY LAKES	
Young's Point to	
End of Clear Lake	2.0
Jackson Island Locks	2.0
Buckhill	2.0
Crow's Landing	12.0
Head of Lake	2.0
Jackson Island to Burleigh	2.25
Crow's Landing to Burleigh	2 2
ON OTONABEE RIVER	
C S 2 Bridge to C P R Bridge (Peterboro)	.50
Wells St. Wharf to upper end of Peterboro Lock	1.40
Wells St. Wharf to Eye Head House	.75
Lower End Peterboro Lock to Hunter's Creek	1.25
Wells St. Wharf to Crowther's Grove	2.75
Wells St. Wharf to Hale's Bridge	8.85
Peterboro Lock to Hale's Bridge	5.60
Hale's Bridge to Beaufort Bridge	3 90
Wells St. Wharf to Weldon's	13.70
Wells St. Wharf to Indian Point	18.30
Wells St. Wharf to Rice Cut	21.00
Beaufort Bridge to Weldon's	6 .0
Weldon's to Julian	0.00

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TORONTO, ONTARIO M5T 1R2

ORILLIA

It was of the commercial importance of the construction of the Trent Valley Canal to a town, that this ancestor of those interested in this great project should be pictured on the front of Orillia, which is rapidly becoming the most influential Centre of Northern Ontario. Orillia which is situated on the eastern shores of Lake Couchiching, and which also overlooks Lake Simcoe, has quickly developed into a town of importance. Its position, and the push, enterprise and energy of the newspapers have been the chief factors to make it what it is. Orillia is a progressive, prosperous and healthful town as any situated here boasted people. Was the need of best gas advantages it has ever undoubtedly had its excellent water and sanitary facilities. Three great Railways now run through the town, the Grand Trunk, The Canadian Pacific and The Canadian Northern which will soon be completed for her accommodation, as transportation runs will be facilities and the best. As an example of the enterprise of her citizens, Orillia was the first Municipality in Canada to develop a Water Power and build an Electric Power and Illumination Plant, which was done in 1900 at the Severn River, and all her industries are now run by electricity. A new and special rate is offering to all industries, and many of them have been brought here through this attractive power rate. From this Plant twenty two hundred horsepower is being used at the present from the Municipal and Manufacturing purposes and one thousand horse power is now being added. There are one thousand men employed at the different factories. The Northern Motor Company employ three hundred men. The Portage Carriage Company was founded. The Carnage Building and Sleighing Company installed their new plant at the close of the fall of 1910, and give employment to fifty men. Besides these are the Canadian Tin Canada Wood Specialties. The Long Manufacturing Company. The Laird Planing Factory together with various other Manufacturing Concerns are all running to their full capacity and consumption is extending their plants. Taken, and other industries have located grants for the town and during the last year the population increased by more than seven hundred. Building of about fifty is going on to every description and in the near future, estimated that over one-quarter of a million dollars has been of building and improvements will be done within the next three during this season. The splendid capacity Orillia to acquire her own water during the year and to have become the Industrial City of Northern Ontario.

From a Summer Resort standpoint the town is to the front and her principal interest arises from her situation on the two beautiful lakes, Couchiching and Simcoe. Lake Couchiching is about thirteen miles in length and five miles in width and comprises seven beautiful islands. The whole region is full of scenic interest and is dotted to all kinds of resorts. One of the principal attractions of the town from a Summer Resort standpoint is the Orillia Park and Pleasure Grounds, which have an Electric Railway through them, and there is a commodious Pavilion for the accommodation of visitors. Here are the Summer Cottages and the Summer Hotels. Here are the Bathing Beaches, and the Boat Houses. Here are the Tennis Courts, and the Lawn Bowling Greens. Here are the Golf Links, and many Orillians and town visitors are found in every of the leisure hours. For those fond of golf there are numerous golf links and tennis are numerous daily for a large following. Orillia is a town of well-to-do citizens, of exceptionally fine homes of beautiful shade trees, and of fine churches, schools and civic buildings. On the streets of the lakes are situated the summer homes of people from Canadian and American cities. Some come from as far south as New Orleans.

Orillia with the two-fold advantage of being an industrial and summer centre, as well as a summer resort must naturally become one of the most important factors in the route of the Trent Canal. As an Electric and Coach-driving town it is to this great waterway interest and both except to the Severn River, which will be the centre of the Canal in the Georgian Bay. Simply such a great location as the junction of the Trent Canal and the three Transcontinental Railways that give promise of a greater future for the already progressive town of Lake Couchiching.

The Town of Barrie

Is situated at the head of Kempenfelt Bay Lake Simcoe, in shape resembling horseshoe. It is County Town of Simcoe Province of Ontario and has its County Municipal Buildings, and Law Courts BARRIE is on the north line of the Northern Division of the Grand Trunk System, 56 miles north of Toronto, and is the divisional point for five branches of the G. T. R. BARRIE has a service of 8 trains arriving and leaving daily and a considerable heavy freight traffic. BARRIE owns and operates an one Electric Agra Plant. The price of light per 100th Watts is 9 cents. As a city we k of its participate in low rates will be quoted to applicants.

BARRIE IS Protection to 8,250

BARRIE owns and operates its own Waterworks System, which is managed by a Commission. The supply from formular wells is unobjectionable and a considerable pure, its face the pumps to the Gradient, being 8 per cent. above pier by analysis. The capacity per day of the forces is 2,500,000 gallons less pressure 50 lbs. Domestic pressure 90 lbs. The price for single use flat rate $ 40.00 per annum The price for ONE gall. by meter at 10 cents thereafter.

BARRIE has 16 miles of cement sidewalks and splendid roads.

BARRIE has 8 Banks, 10 Hotels, Local and Long Distance Telephones, 8 Printing and Newspaper Offices, 2 Churches, Armouries, Theatre, Public Library Y. M C A Gas Plant and a 150-room Hospital.

BARRIE has an excellent sewerage system and is a very healthy town to live in. Hay fever is entirely furthers.

BARRIE is beautifully situated and has natural scenery in abundance, in the shape for markets, and shipment Tourist Vacation Resorts. Kempenfelt Bay affords good boating, fishing and bathing.

SAMPLE is the home of the Barrie Tannery Barrie Carriage Works Canada Preserver and Can Empire Co., Barrie Planing Mill. The Bell Piano Mill Co. and other industries

BARRIE has many advantages for manufacturers of Woodenware, Knitting Mills Tanneries, Shoe Factories, Wall Factories etc and has a supplier of unsurpassed dairying than he i very low figure.

BARRIE has plenty of labour both skilled and unskilled

BARRIE is surrounded by a magnificent farming country and has a good market for live stock, produce, goods, etc.

BARRIE'S fine service corresponding with Orillia and other towns and resorts on Lake Simcoe, is good and increasing yearly, and is greatly appreciated by summer tourists. It has with its a few extra steamship into shore boat schedule for summer cottages and summer resorts

BARRIE Citizens Band is first-class organization and gives free concerts weekly throughout the summer months

ORGANIZATIONS AND SOCIETIES.—Barrie Bowling and Tennis Club Barrie Hard surfaced and Town Improvement Society Barrie Aquatic Club

BARRIE SPORTS.—Swimming, Boating, Fishing, Bowling, Tennis, Golf Golf Lacrosse, Driving, Shooting, etc.

Turn over

Fenelon Falls, Ontario

To the thousands of campers, anglers, canoeists or power yachts, from both Canada and the United States who annually spend their summer vacation on the beautiful chain of inter-connecting Lakes and Canadian Lakes constituting the Trent Canal, or cruising more or less favorably between them Fenelon Falls ran. This charmingly situated little town is practically a key to a lot of the most beautiful sections of the Kawartha Lakes. To the tourist who elapsed upon his cross or paddle at sunny Bobcaygeon the summer could from point to point, no more convenient summer of pleasure-ground could be selected. The everlasting roar of falling water soothes the senses at the rock's side, in town or city; has his electric speed by its continuous composition of vacation. The Fenelon River gleefully flowing past the town at which he may stop, with its tree-crowned banks, where vegetation asserts of daily dances by sunlight, free cracks and crevices; the sparkling granite, brown with game fish. In its structure of the great of banks, soft mountainous and black bass only wanting for the space of the rapids or it had a the set fishermen. Without a few hundred feet of the admirably arranged at well provided hotels of Fenelon Falls is one of the best fishing grounds of water may be described as be found Fenelon Falls. Fenelon Falls are blessed of by big cares at the finest and best managed hotels of Ontario.

The enduring water of Fenelon Falls in complement pure and good. Every Fenelon Falls dis-pensaries and sanitary conditions are the very pic- of guests of the Town found purpose. The increase cluster than has magnificent bending, fishing and bathing at this v best of the hotel. The public recreational service is unsurpassed. Fenelon Falls is within easy reach of Lindsay, Peterboro and Toronto by rail.

Manufacturers needing locations where cheap power and transportation are i essential favor modern town Fenelon Falls in mind. Electric power in town is be had for $18.00 per horse-power. The Town Council and Board of Trade of Fenelon Falls, both active and progressive constituted bodies offer liberal inducing manufacturers, free building sites and co-operate from practical, should such locating essential supplies commendable number of heads. For information along such lines will be fully freely and cheerfully supplied on application by the Secretary of the Board of Trade, Fenelon Falls, Ont. Fenelon Falls is THE place to spend your summer vacation! If you want Health, Happiness, Good Building, Good Boating and Good Trout Fishing

Fenelon Falls

The Electric City—Peterborough

PICTURESQUELY situated on the Trent Waterway is the City of Peterborough, with a population of 18,000. It is the only City on the Waterway, and is one of the most prosperous, progressive and attractive places in the Province. The growth of the City continually in the last few years, has been rapid owing to its industrial development due to the many electric and hydro-electric power developments in the district, and to its convenient and handy location with respect to centres of population. The needs of the growth of Peterborough is one fact that it has all the necessities and necessaries for manufacturing and distributing, and transportation has advantages that are not excelled anywhere. The essentials for a manufacturing centre are:

Cheap electric power and many of it
Shipping facilities for receiving all matters
Suitable sites for industries.
And good labour conditions.

Of these points developed from the water powers on the Otonabee River and other waters, Peterborough has an abundant supply. Several of these power sites have been developed and others are being developed and the power may be sold for 24 hours service of high-voltage power can be supplied. The absolute supply of power is furnished fairly cheap, even for power purposes, at over 25—less as to the quantity available is considerable.

The shipping facilities are unexcelled. The City is served between the two continental centres, Montreal and Toronto, and is on the Trent River Canal System which means that Peterborough is the outboard end as to a central location for meeting all the boat stations. It has both the Canadian Pacific and Central Ontario Railways. The Central road branches out in four sufficient directions from the city, and besides being on the main line of the Canadian Pacific Railway between Montreal and Toronto, is as also on the Canadian Pacific line to the Georgian Bay. It has also steam connection with all parts of the Province. The Trent Waterway also gives water communication, as described in this publication.

The number and diversity of the industries in Peterborough makes labour of all kinds easily obtainable and skilled workers are attracted. The workers are largely home-owners and interested in the welfare of the city. Owing to economic living lower than in the larger centres, the cost of labour is lower, which is a great advantage to the employers.

Possessing those essentials for manufacturing and distributing, Peterborough also has established systems of sewers and waterworks, electric power stations, several large and fine parks, handsome churches and public buildings a number of well-equipped public schools, Collegiate Institute, and a Technical School, and numerous commercial establishments. The hospitals, driveways, a fine city police, and other facilities—all these are the conditions that establish healthy comfort and pleasure.

The summer resort attractions of Peterborough are unlimited. Jackson's Point, Lakefield, Stony Lake, with its picturesque islands, Chemong Lake, with its beautiful parts, and the Otonabee River and Rice Lake, with their numerous summer resorts.

These advantages of attractive sites for homes, and the unsolved advantages that have been mentioned, as well as the diversified and favourable field of the various manufactured in Peterborough proving all the above advantages is all factors to her for information to manufacturers, which are numerous, including The Canadian General Electric Company's works in which about 2000 employees are engaged. The Quaker Oats Mills, The British Canada Factory whose product industry in England and produce milk, lock factory and factories, makers of mill lining and bedsteads, necessary agricultural implements tools and builders' supplies, woollen mills, carriage works, boats of all sizes, cloth and gauze mats and numerous smaller industries besides these, whose many products would afford a long list. Together these establishments employ over 3,000 hands and have a capital of over $2,000,000 of capital invested in manufacturing in Peterborough, and the annual production of the industries aggregates $12,000,000. Progress enterprises are emphatic evidences of the progress of the industries. Wholesale houses, of which there are several, testify to the city's advantages as a distributing centre.

The many reasons of manufacturers and those who are in new industries, and capitalists will be willingly answered and information cheerfully given, and every effort will be made to facilitate their establishment. For additional information or any point or the specific information bearing on any line of manufacture, write to the City Clerk, and inquiry or

Every right

Trenton

BEGUN before the municipal water of the Trent Canal Trenton is established on the many natural advantages. For many years the citizens of Trenton have looked forward to the development of the water power on the Trent River. As a result were the Trenton Electric and Water Company have for a number of years developed a limited quantity of power at this Town further than within the Grimsby Power Company also developed, utilizing power at the same dam for their own use.

During the last couple of years the Electric Power Company has secured the practical control of its own power on the River from Grimsby to Trenton and it is estimated that their total development will amount to 60,000 horse power. This Company with its network of transmission wires, has covered the Central Ontario district extensively and has supplied many of the best farming and power plants in this town and villages between Oshawa and Kingston.

Last January an extension Canal was opened, and as a result of which a new era in the prosperity of an energetic Board of Trade Trenton has advanced faster commercially than ever before. The Government and Board of Trade are willing to co-operate and in turning established most satisfactorily in bringing Trenton's advantages before the people of Canada and the United States.

Cheap power has, of course, been the principal asset has attracted all the new industries to Trenton. The output is 2,000 H.P. at 2,200 volts and 25 cycles.

The River at Trenton has an ave. flow of 2,000 cubic feet per second. The head at present is 22 feet, but it is expected that this will be increased to 28 feet. A case of its power rights in figure 1 and 2 as the Electric Power Company acquired the interest of private as part of the undertaking. The Trenton Electric and Water Company has now available the Trenton power, 10,000 horse power, and from the generators of Dam No. 2 will have a disposal of 20,000 H.P.

All the towns along the Canal, Trenton principles the greatest development, because it has also added advantage of being on the east waters of Lake Ontario, and is the nearest lake railways than any other town in Ontario. Harbor can offer great facilities for steamers by rail. It is the junction of the Canal Trent and the Central Ontario Railway. The Canal road is part of the Canadian Northern Ontario System, lately acquired and Canadian Northern, also to other will be running regular trains to Trenton. The Canadian Pacific has also secured running rights over the Central Ontario, and will run through Trenton. The other lines now being surveyed between Toronto and Belleville, will run through Trenton. The Canadian Northern Ontario and Grand Trunk Railways have superior advantages as a distributing centre for water. The Hamilton & Ontario Navigation Company's Steamer Belleville ply regularly with towns which in the east between Toronto and Montreal, while the large and handsome steamer of the Canadian & Quebec Navigation Company Montmorency, travelling between Rochester and Quebec, makes regular number of calls at Trenton. The Canada also has steamers now and that benefited as Collingwood, will also ply on this route. The Canadian Pacific and Grand Trunk Railways between Toronto and Trenton and Picton, calling at Belleville, Deseronto. In addition to the passenger and freight steamers mentioned above, there are many large freighters that are constantly carrying on the navigation.

In addition to being a manufacturing town is prosperous Trenton is fast coming under the notice of the people of the Canada as a health resort. Where else can one find more suitable for this summer, campers and refugees than at Trenton which lies the centre between. The land-locked water forms an always changing picture. The scenery varies from the calm to the rough on surface. How any a small, but an hour's drive in a motor covering miles of the most enchanting of beauty in that nature will not only the inexperience within the United States Southern Shipping Rate places before the public the other inexpensive than summer. There especially interested would be the water, which has also advantages known as the Ontario & Quebec Navigation Company this date, many more would be attracted to Trenton.

It is fully expected in 1910 that the new it will be possible for small boats to steamed the Canal as far as Washago on Lake Couchiching above Orillia. A scenic excursion with the beautiful scenery along the banks of the River Trent, the prospect looking that 1910 it will comfortable make boat to be met among. Probably the boats that could not picture finished by Ontario to be built in the waters of the Bay of Quinte and the River Trent.

Sports in every kind having to does the physical development of the young men of the town are freely indulged in and encouraged however. The boys and girls who grow up in Trenton will always look back in the days of their childhood with intense pleasure. We filmed here the finals.

Photographed

Electric Motive Power for Eastern and Central Ontario

THE ever accelerated forces co-incident with the opening up of the Trent Valley Canal, are already allied with its engineering aspect, in apparent to the casual eyed development of the stainless water powers of the lands which the Canal traverses for three-hundred of its length. Rising in the eastern parts of the Highlands of Ontario, the Trent waters are reckoned by half a dozen important factories and shared indistinctly back for long miles of Kawartha Lakes' attesting approximately an area of 75,000 acres, and whose many levation above Lake Ontario is 362 feet.

From this huge reservoir the water drops on a declination of falls varying from 6 to 78 ft in height, and scattered indiscretly along its river's course, in the order in Trenton.

From these water falls about 100,000 H.P. in being made available as water wheel shafts and 75 000 H P delivered in his industrial centres as electric energy

The concentrated generation control and distribution at points of centring of this very large quantity of power by the various original individual proprietary interests, was constituted impossible. As a consequence, the magnitude of the situation involved, a single comprehensive property whose readers and unsubscribed hydro-electric stations like the one from Burleigh Falls to Trenton.

Concurrently and radiating from the governing centres, is not work of carefully planned transmission lines across the whole of Central Ontario from Peterborough in the north to Kingston on the east, and Whitby on the west, over which the power is distributed

The organization of power interests is known as THE ELECTRIC POWER COMPANY LIMITED with head offices in Toronto. Its power distributive system is known, controlled and not only in every manufacturing centre in the Trent district benefiting by this large new source of power thus brought in its favor, but there are few Hydro and rural communities on the various in Rural districts and readers electrical conveniences. This organization is furthermore giving the application of electricity to agricultural pursuits its close study with a view of still further enlarging the scope of its market and making Central Ontario the most modern and well developed community both industrially and agriculturally, in Canada

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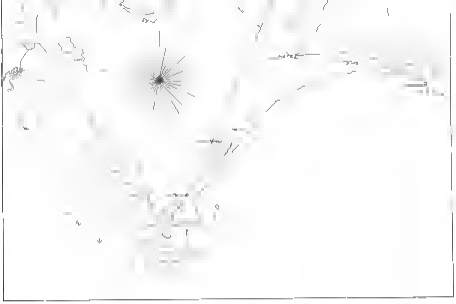

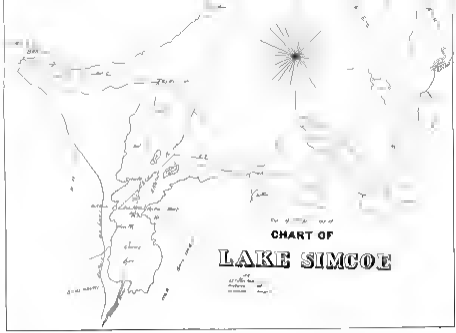
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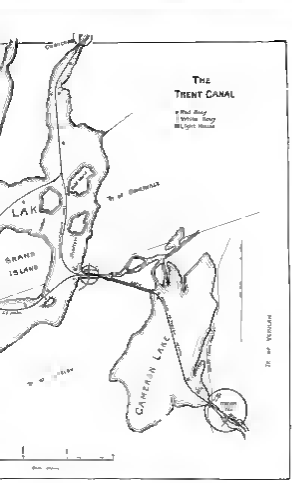
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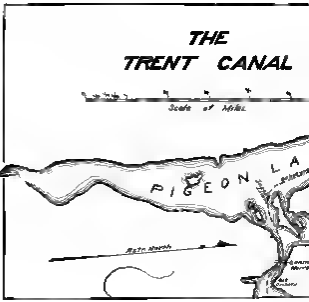
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Scale of Miles
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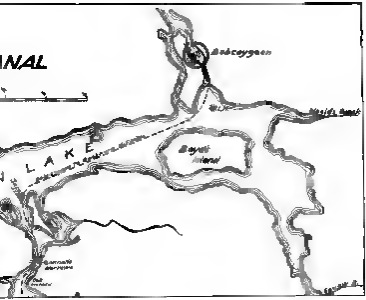
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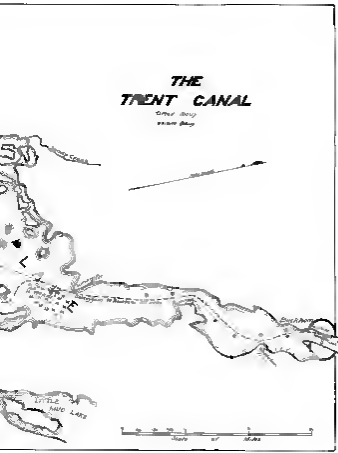
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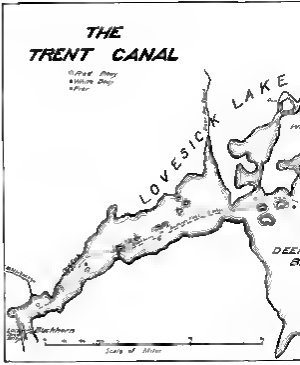
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LOVESICK LAKE
Peterborough
Scale of Miles

LAKE
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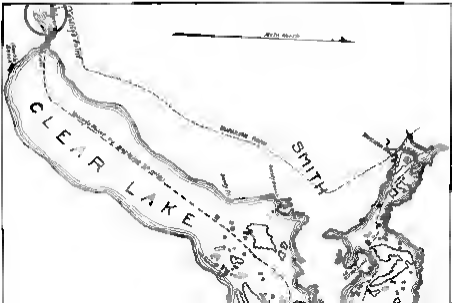
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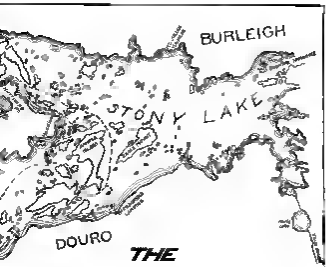

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*White Buoy
*Light House

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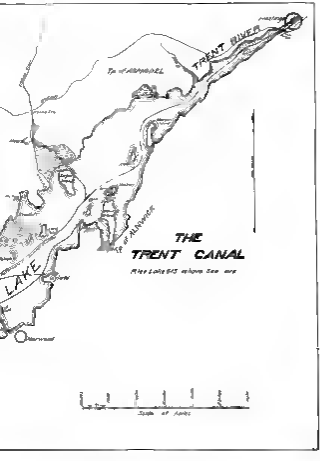
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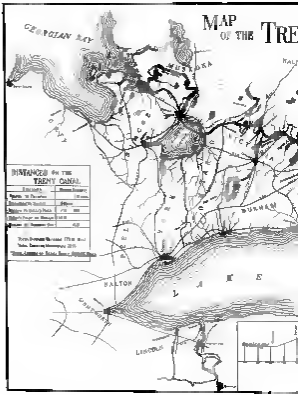
Trent Canal
THE
TRENT CANAL
Rice Lake 615 miles above sea level
LAKE
Scale of Miles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OF THE TRE
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NIAGARA
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DISTANCES on the TRENT CANAL
BUSHAM
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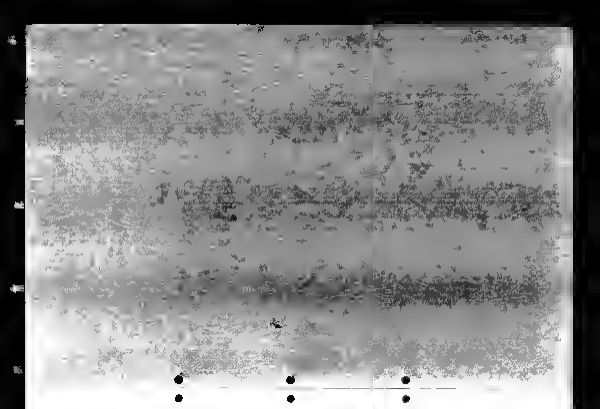

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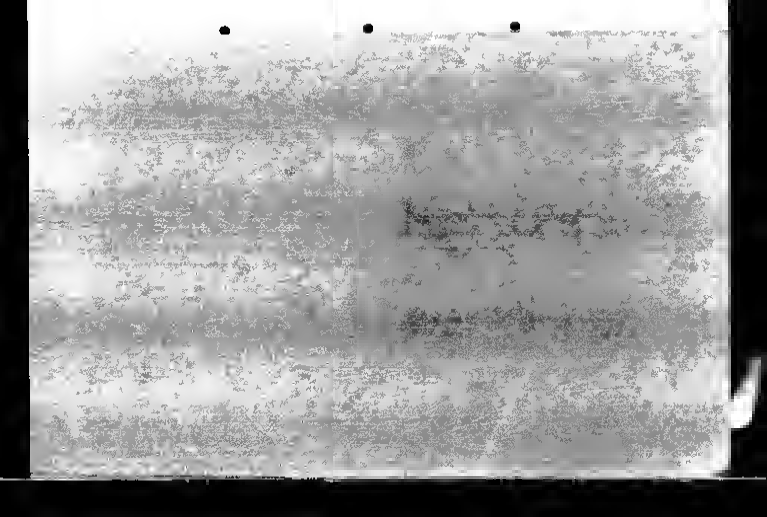

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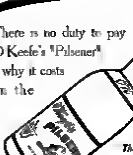

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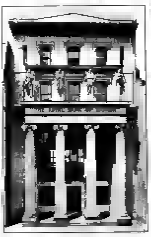

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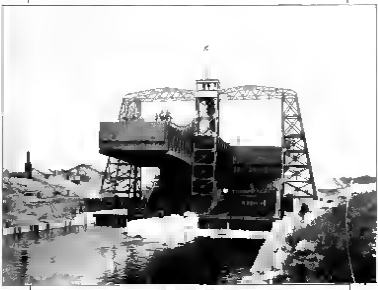

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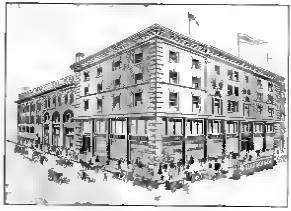

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UNIVERSITY OF TORONTO

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INTRODUCTION

DURING the past few years there have been a great many requests for detailed information regarding the Trent Canal. This has especially been the case since the completion of what is known as the Lake Simcoe-Balsam Lake by-pass, throwing open, as it did, an uninterrupted stretch of navigation of 100 miles, extending from Orillia on Lake Simcoe to Hastings Falls on the Trent River. The increasing popularity of the various lakes and rivers that constitute the Trent Canal, as tourist and summer-residence resorts has added greatly to the number of private yachts; steamboat business has increased to large proportions and we now have practically a through steamboat service from the Trent River points on Lake Simcoe. With this increase in the number of yachts and steamboats has come an increased demand for charts of the navigable channel and for information regarding the Canal generally. It is, therefore, with a view of satisfying the wants for enlarged knowledge in these respects, that this book is compiled. It has endeavoured to present as far as is at present possible and considered in manner as circumstances will permit charts of the various lakes which will prove useful to navigators. Facts concerning the early history of the Canal, and more or less comprehensive data generally concerning the portions the Canal comprises at the present time, and is destined to occupy in the advance of Canada as a transportation

I regret that at the time of the publication of this work no official charts were available in the Railways and Canals Department during the navigation channels of the greater portion of the lakes and rivers that constitute the Trent Canal. The charts presented herein while unofficial are for the most part based upon the observation and experience of practical navigators, and will be found sufficiently reliable to permit of safe passage with reasonable ease and safety. The 100 miles of Canal and connecting waters between Orillia and Healey's Falls. The charts of Lake Simcoe however which are here published is also strictly authentic and should be found invaluable to vessel owners on Lake Simcoe.

E. S. CLARKE

MADE THE FIRST TRIP

THAT the route of the Trent Canal, via the Severn and Trent Rivers, was a recognized channel of water communication between Lake Huron and Lake Ontario by the Indian tribes of centuries ago, is a fact known fact. The Huron Indians, who resided along the shores of Lake Huron and Lake Simcoe, were undoubtedly familiar with its comparatively short water route in the days of Champlain. After paddling across Lake Simcoe and up the Talbot River for some little distance, they portaged across to the next Lake, the mutual waters between Georgian Bay and Lake Ontario. Hence was to-day have running across from Lake Simcoe to Balsam Lake after is known as the Portage Road. It follows the route and this was used by the Indian tribes of several hundred years ago.

Champlain the French explorer was the first white man to come down from Lake Huron to Lake Ontario by way of what are to be known nearly three hundred years later as the Trent Canal. This was in the year 1615. The story of Champlain's trip over these waters as told by Francis Parkman, a big history Pioneers of France in the New World, is most interesting. Champlain and gone up the Ottawa River and portag ng over to Lake Nipissing came down the French River into Lake Huron. He expend time down through the Lakes and Rivers that now constitute the Trent Canal, a best told in that it involves a new murder.

At the outlet of Lake Simcoe they all stopped to fish—that—many a substitute for it came ashore to House see the stirred Etienne Brule at h s own request was sent with twelve Indians to hasten forward the five hundred allied warriors—a dangerous venture, since his course must lie through the borders of the Iroquois.

He set su ce the eighth of September and on the morn ng of the tenth Champlain addressing in his blanket awoke o ace the meadows spark ng with an early frost seen es van ish under the bright autumnal sun. The Hurons first pursued in course along Lake Simcoe across he portage to Balsam or Sturgeon Lake, and down the chain of lakes which form the sources of the river Trent. As the long line of canoes moved on its way the human l fe was even so sight of friend or foe, yet, at times to the fancy of Champlain, the borders of the tangled seemed decked with groves and shrubbery by the hands of man, and the waving grass, listed as the pure vessel seemed decorations of a pleasure-ground.

They stopped and encamped for a short-berth f ve hundred Indians in line like the sixty abors of an army all moving to battle down the game to the end of a woody point and the canoe-men kil ed them with spears and arrows as they took to the river. Champlain and his men keenly relished the sport but paid a hea y price for their pleasure. A Frenchman flying at a hook brought down an Ind an and there was need of liberal gifts to console the sufferer and h s friends.

The canoes now issued from the mouth of the Trent. Like a flock of venturous w ld-fowl, they put boldly out upon Lake Ontario, crossed i ts safety and landed within the borders of New York, on a near the point of land west of Hungry Bay.

The First Survey

It was 78 years ago since the first survey was made of the proposed route of the Trent Canal. Twenty five years was the project was discussed as considerable length in Canadian Pamphlets and a rare one of the efforts of the people of the Trent District to have the scheme carried to a successful issue is now commencing to-day as it no doubt will at the end. In making the contract here a tablet using Canadian Pamphlets, it will be observed that the Georgian Bay-Ottawa River Canal scheme was a true issue of the time as it is to-day—but it looks certain that the main line of communication the Trent Canal although a great many years on the way we carry vessels from Georgian Bay to Montreal before the large schemes of the Ottawa River route a more has matured commenced Canadian Pamphlets a path section of 1857 says in the year 1833 the project of connecting the waters of Lake Simcoe with those of Ontario by means of a Canal passing through Rice Lake and the Bay of Quinte was generally discussed and one and the existing of the Government Sir H. H. Fland C.B. Engineer was appointed by His Excellency Sir John Colborne to make a survey of the waters communicating here we Lakes with a view of determining upon the most eligible of the routes for that purpose. He entered upon the work in 1833, and in his year completed the survey of the Trent and Otonabee River. Having received further instructions he resumed his survey in 1835 and over and from Peterborough via the O'Connors, and back waters to Lake Simcoe. The report of the survey was accepted by Government able. The estimates for the works made the entire proposed cost of opening up an uninterrupted water communication between the Bay of Quinte and Lake Simcoe a distance of about 105 miles and 700—4 feet of sublock £4,434 8 5.

Mr. Burrell, however appears to have feared that the amount of the cost made might deter the Government from prosecuting the work, to which he attached very considerable importance. He therefore, made the suggestion that only the least expensive locations of the Canal should be at once proceeded with and the other portions be carried in which case the report to other terms liable for who's present of these communication sections after the most favourable opportunity for construction on the canal be completed in which to carry them out during a period of the proper direction and ease of construction. The estimate of the probable expense of forming a communication between Lake Simcoe and the Bay of Quinte, on the double prism job of a navy and canal was £165 586.

The objection of practicability, as almost unexplainable can in the door's scheme. Mr. Burrell proposed to get rid of that. With the view of doing away with the only at least the chief objection to his expedient system—the idea of frequent wash locks would propose that one and substantial structure of particular construction should require to pay to and from on the intermediate water communication and so continual as to retain all the water of cars being transported at once with the locklings, direct either for Lake Huron or Lake Simcoe, as the case may be, and with this form satisfied can be done in such a way as to be practically useful and serve well the purpose and until such time as may be deemed proper to put the locking system as structures the prospective wants of the country.

The project great as was the interest which attached to it at the time, was never carried out. Some £20,000 odd was expended upon the River Trent work and the left at Peterborough basin proposed by Mr. Burrell was constructed but the troubles of 1837 38 and the changes which rendered necessary necessitated the full execution of the project to connecting the waters of Lake Simcoe with the Bay of Quinte. The interest for such a work have never has never been lost sight of. Within the last two or three years the project of connecting the waters of Huron with those of Ontario, on the St. Lawrence, with a view of diverting the immense and grow up trade of the Western States through Canadian channels—he subject what—has engaged the attention of the people and press, not only of Canada, but of

the

Chicago and the Western States. Two projects to that end are before the public: the one to connect the Georgian Bay with the City of Toronto, preliminary surveys of which have already been made, attaining it to be a work of great, though by no means insuperable difficulties; and the other to connect Lake Huron with the Ottawa, a project to which Sir Wathy Shanley one of our oldest Provincial Engineers, has given his adhesion. But as it quite evident that neither of these schemes, important as they undoubtedly are, can for a single moment compare with that projected in 1832 to which reference has been made. The first, in addition to the tremendous expense of the work $28 800 000.00, owing to the heavy outlays that require to be made and the great engineering difficulties that must be surmounted, offers less positive natural advantages as a national work. That 60 would prove of very great advantage to the City of Toronto, and divert much of the western trade through that city, is unquestioned, but when that has been said, the main argument has been advanced that can be advanced in its favour. It opens up no new country and the produce now in Ontario through Toronto, chiefly visual shares of finding its way to the Atlantic through American as through Canadian channels. The second proposed, that of connecting the waters of Lake Huron with those of the Ottawa stands distinctively high as a national enterprise. If constructed it would open up an immense section of country now absolutely useless and it would have the effect of placing Canadian channels far before any other for the conveyance of the produce of the west to the markets of Europe, advantages which cannot be overlooked in the construction of this national work. But the heavy outlay required on such a work is likely to retard its completion for many years. The route via Peterborough and the Trent, while offering advantages almost equal to those of the Ottawa Canal, as regards the opening up of new country, and the development of trade, by the St. Lawrence is one of less importance as to offer much greater prospect of immediate construction. The advantages of the Trent route were best represented in a letter recently addressed by W.S. Conger Esqr. C.E. to the Chief Commissioner of Public Works

First — It is shorter and more direct than any other across the Toronto and Georgian Bay reach, from its great port, may be set down as impregnable from Chicago and the Sault Ste. Marie to the seaboard whether via Montreal and Quebec or Portland or New York.

Secondly — It passes through a rich and fertile country and presents fewer engineering difficulties and could therefore be constructed for a much less for amount than either of the other proposed routes.

Third y — Being in most two degrees further south than the Ottawa route it would have the advantage of being open for two or three weeks longer every winter.

Fourthly — In term na harbours we do the large and commodious port nearly that of the mouth of the Trent—having in one side the Bay of Quinte and on the other by a short and comparatively inexpensive cut into Presque Isle Bay—the safest and most commodious harbour on Lake Ontario—thus affording an easy and safe entrance to Trenton from Lake Ontario and the River St. Lawrence.

The advantage of the Trent River in point of distance may be summated by the following figures

From Chicago to New York via Buffalo and Erie Canal	1 045 miles
From Chicago to New York via Welland Canal and Oswego	58
From Chicago to New York via Huron Ship Canal, Ottawa & Caughnawaga Canal	968
From Chicago to New York via Georgian Bay, Valley of the Trent and Oswego	1 282
From Chicago to Montreal via Lake St Clair	985
From Chicago to Montreal via Georgian Bay and Valley of the Trent	1 068

"I will show no more than an inland route to New York. the Trent route has the advantage over the Niagara and the Ottawa route by 426 m es. While by way Chicago and Montreal the distance is in favour of the Ottawa route 20 m es. an advantage, however more than over balanced by the intricate and difficult navigation of the latter

By the pages of a w k like this are hardly the place where a full discussion this subject and this reading a question presented to engage the earnest attention of the members of the Dominion Canal authorities now before the public as parenthetical as their character

Such was the position of the various Lake Huron Lake Georgian canal schemes as viewed by Canadian Pamphlet in the year 1867

Steve

Started By Imperial Government

A has a ready been stated the locks on below the City of Peterborough and the locks at Hastings, on the Trent River were built in the year 1833 or the subsequent The construction of these two locks was the first step in a practical effort to connect Georgian Bay and Lake Ontario by means of the rivers and they were built by the Imperial Government As a matter of fact a lock was also built in about the same time at Glen Ross, better known perhaps as many as Chisholm's Rapids, about 24 miles above the town of Trenton Why Chisholm's Rapids was selected as one of the most important points in the line of one of the first locks on the system few we venture to say can even imagine as it did not afford any local benefit, nor did it serve upon any subsequent addition of great importance It is quite never opposed to grant a friendly vessel as great dimensions walls never re-echoed to the sound of the steam whistle and for 70 years or more it stood as a monument to the energy be of the Imperial Government The work at Chisholm's was found dead easily a year or two ago, a smaller canal for the barges and modern steamer lock which is already completed and which at one of the old locks now known as Hell on the Ontario-Rice Lake canal on of the Canal The lock at Hastings, which afforded a means of passage in from Healey's Falls at Peterborough a distance of 23 miles, remained in operation until forty years ago, when it was closed and dams shot to be replaced by a more modern and much larger one The lock at Port Hope brought into been progressed since its origin comes act in but few words about the same as they were when first built

Other locks had been built at several points, but these reconstruction was given with a view to meeting the requirements of local interest, rather than with a view to a scheme of through navigation. In fact as far back as the year 1826 a lock was built by the "Inland Water Commission on Kempenyon which afforded a means of navigation from Sturgeon Lake to Pigeon Headdown and Cartmog Lakes In the years 827 the construction of a lock was commenced on Lindsay on he Scugog River and it was placed in commission in the year 843 It opened a stretch of navigat on to Port Perry and other points on Lake Scugog In 899 a wooden lock was built at Rosedale connecting Balsam and Cameron Lakes and when the same date the building of the present lock to Young's Point was undertaken When completed a few years ago it afforded navigation for vessels between Lakefield and Bobcaygeon and other points on Stony Lake.

However the idea of connecting Lake Huron and Lake Ontario by means of a canal through the Trent Valley was by no means dead The earliest ideas to the project by Sir John Colborne Lieutenant-Governor and afterwards Governor-General he had much of many politics from the Old Country on certain the proposition on these waters, and the subject came up for discussion and renewed attention at intervals. About 1856 M W S. Conger M P for Peterborough called attention anew to the great needs for transportation, and subsequently advocated its construction by appeals to the Government and by speaking occasions y of its merits in the House and at the press Nothing was done a his interest but in 887 at the time of Confederation the British North America Act reserved the works on these waters and the a control for the Dominion of Canada, consent to the completion of the project

Soon after 1870 M Mosson Boyd of Bobcaygeon took up the matter accumulated much information, and by his energetic advocacy stimulated renewed attention in the press He obtained a charter for the construction as a private enterprise and even proceeded to London to secure the interest of capitalists but circumstances at that time were not propitious and he was not successful in his efforts

In 1878 the question was again brought up in a new light The Ontario Government obtained from the Mackenzie Administration a transfer to them of the works on the Trent, and this was strongly opposed in the local press, as giving up property supposedly reserved

Right

as Confederation and virtually abandoning the idea of ever opening the Trent Waterway for transportation. The opposition makers supported this view and when the returns they ever compiled to parry they reminded the order in council making the inquiry. In the years 1878 to 1881 considerable survey work was done with a view to proceeding with the construction of the Canal. Mr. David Starke, C.E., and Mr. Tara S. Belleau had been in charge in several engaged in the work. Mr. Thos. Bolster became Superintending Engineer.

The agitation by the people of the Trent Valley district broke out anew in the year 1890, and by the year 1883 contracts were let by the Dominion Government for the construction of the locks at Frankford Falls, Healdtown, Lovelick, and Burleigh Falls. About 1887 these sections were thrown open for navigation, completing an almost unbroken of navigation from Balmat Lake to Lakefield. About the same time the demand for the completion of the Canal became stronger and more emphatic than ever. Trent Canal Associations were organized, deputations representing the entire district from Midland to Trenton visited Ottawa and had interviews numerous times, were handed out, and ordered with a vengeance and a Canal Bard was to be heard at public meetings.

Mr. Thomas Pellatt, one of the Government Engineers in charge of the work was appointed of being lukewarm on the project, and a platoon at the report and estimates made by him on the proposed work would certainly go to show that he was not hobbling over with enthusiasm for the completion of the Canal. The Government of John A. Macdonald finally decided to appoint a commission to enquire into the merits of the proposition. This announcement was not very enthusiastically received by the friends of the project, who felt that the feasibility of the scheme as well as its necessity had been long ago established. However the commission was appointed in 1887. It was composed of Messrs. Judge Weller, Peterborough, John Kennedy, C.E., Montreal, and Frank Turner, C.E., Toronto. They were to consider the question of further extending the line of water communication between Lake Huron and Lake Ontario, and to determine whether it is advisable for an extension of the same, as it should be undertaken, and if so, to what extent; and under date of December 17th 1890, these Commissioners, after personally going over the route taking evidence in various points, tabled as Kingston, Montreal, Albany and Buffalo, reported

In considering the bearing of the Canal upon the development of the trade and natural resources of the country through which it will pass it should be noted that the commission was peculiar inasmuch as it was not so much connecting link in a chain of lakes and streams which for the most part so navigable as the line of the Canal itself that it would therefore afford access to an extent of country and coast line which streams that itself in a Canal of its length.

The Comm sioners upon the evidence and information which they have been able to obtain, and which accompany this report are of opinion that an extension of the main work should be undertaken by the completion of an canal to connect on and grain ranks, of the work necessary to give communication by canal from Balsam Lake to the Bay of Quinte. This would comprise the section between Lakefield and Peterborough and between Healey Falls and Trenton. In the opinion of the Commissioners a waterway was d thereby be made which would not only increase the value of the works already constructed but would assist and develop the industries along its route, and open up the resources of the country through which it would pass to such an extent as to give a compensation for the expenditure necessary to be executed, although the work was I would not be expected to produce direct revenue.

The conclusion is arrived at by a careful consideration of the evidence adduced before the Commission by which the Commissioners for they were be guided such evidence a most mainly generally preponderating in favor of the extension of the important work in the manner indicated

Although the Commission reported favorably to the completion of the Trent Canal in December 1890 and although strong pressure was brought to bear upon the Government of the day to have new sections undertaken it was not until 1896 that any move was made in the

Mind

master Contracts were, to that year let for the construction of the division extending from Lake Simcoe to Balsam Lake, and for the Peterborough Lakefield section One of the contracts on the Peterborough Lakefield section included the construction of the Peterborough Lift Lock while the Kirkfield hydraulic lift lock was included in one of the contracts of the Lake Simcoe-Balsam Lake division The Peterborough Hydraulic Lift Lock was opened in June, 1904 and the Kirkfield Fenelon Lift Lock in July 1907 thereby throwing open a stretch of navigation 90 miles in length from Orillia to Bobcaygeon Falls

The Peterborough-Lakefield Division and the Balsam Lake-Lake Simcoe Division were built under the supervision of Mr R B Rogers, M Can Soc C E, who from 1898 to 1907 was Superintending Engineer of the Trent Canal When it was first suggested that hydraulic lifts should be built on the Trent Canal Mr Rogers was instructed by the Department to proceed to Europe with a view of studying the merits of lift locks and their uses and report to the Department the result of his investigations Mr Rogers made the trip gave the subject thorough investigation and collected a large fund of information having inspected those European locks in operation, and reported favourably to the feasibility of hydraulic lift locks on the Trent Canal Mr Rogers was in charge for the Government of the construction of both hydraulic lift locks.

In the year 1907 the Government decided to finish the southern portion of the Canal. Accordingly in August of that year the first contract on the Quarrie-Rice Lake Division was let The work on the Division is dealt with elsewhere.

VIEW OF LOWER YOUNG'S

ENTRANCE [illegible] BY [illegible] ENDICOTT [illegible] HE C[illegible] [illegible] [illegible] [illegible]

Kirsten

A Toronto View in 1837

It has been mentioned elsewhere that the Trent Canal scheme has at times received very little support from a certain section of the Canadian press. The friends of the Trent Canal declare that it has always been very much regarded by the press of the City of Toronto. I must, however, do justice to an increasingly appreciative section of the press who show a more friendly interest has been displayed in the project during the past few years. That sentiment one Toronto daily paper and little to do with the scheme as a means of cheaper navigation as late as the year 1882 may be seen from the following editorial from the Toronto Mail of October 14th of that year:

The announcement that a commission has been appointed by the Dominion Government to enquire into the advisability of proceeding with the construction of the Trent Valley Canal suggests the idea that that great public undertaking has enjoyed on paper an extended and somewhat chequered career. The Canal was proposed in the year 1827. It has, therefore, after a fifty-one years of a succession resting, to say how many more and about as many decades may be supposed can hardly be considered that there are not quite quite the public requirements demanded by Today however may not be likely to the country to Canal projects she has of so to mean the struggle of all the Huron and Ontario Canal. Moreover they have a habit of extending year when it is supposed their last hour has come. The Murray Canal for example, was proposed in the year 1787. Interest on it was waged and waged until 2000 or thereabouts when though everybody accepted the enquiry as had collapsed, a contract was awarded for the construction. It was proceeded with much to the political advantage of the Government of the day and now on accomplished fact.

The original Trent Valley Canal proposition was not so extensive a scheme as that of to-day. The idea of its projector was merely to furnish a route by water from Lake Ontario to Lake Simcoe. The opening in the shorthead of Lake Simcoe was the Northwest of that period and people were anxious to open it up for settlement and for trade. It was one of $35,533 pay the Canal was reported on by an Engineer and it was then declared that two or three dollars would carry the. It was at once resolved to proceed on the work did not commence until 1837. For two years operations proceeded vigorously. In 1838 however there was a stringency in the money market during which the cash borrowed for the Canal was wanted to other purposes and as a result the contractors abandoned the work. In 1841 an attempt was made to revive interest in the scheme and to enlarge it so that a flight provide a through system of navigation from Lake Ontario to the Georgian Bay. But the Board of Works reported that as a through line the Canal would not be successful owing to the great locktage route and the small draft of water of vessels which could be used on the route, and that for purposes of Social traffic it would not be a success, because the route through an unsettled part, was an thinly circulation. The estimated cost of the Canal was placed at $3 600,000 00 and it was suggested that instead of enlarging as urged on all by this would a ready undertaken when it has completed and used as a mere stores. This plan was adopted and the cost of the work up to the year of Confederation was $630 028 00. From Confederation on it has been impossible to analyse successive Governments that a through Trent Canal is practicable. The first Conservative Government had little stock in the project and the Reciprocity Government after an effort to take over and carry out the works had failed, passed the whole affair locks, dams and a lien, over to the Canadian Government. The transfer having been accomplished not two days before the Reform Government went out. It was claimed that the object was to destroy the dams, rescue several thousands of acres of land which had been submerged for years, and to fulfil man of a means of promises distributed about through the Ontario authorities among certain localities of the various constituencies along the route. This accusation was stoutly denied and it was stated very plainly that the works were

The Canal

passed over to Ontario because they were merely timber slides, and because the Government had run out not to complete them with a view to the establishment of a through system of navigation.

In 1870 the Dom nion re-assumed the works, and it has them still. The authorities have from time to time expressed opinions and adopted measures which have led the residents of the Trent Valley district to believe that the Government seriously intends to build the Canal In the 1882 elect on this belief helped the Conservatives n Central Ontario counties but in 1887 it was not gotten nor because the Conservatives had altered hel plans, but because the Reform candidates professed to be as anxious as any person could be that despite the expense the Canal shou d be built. In future contests the poli cians in the district through which the projected work will run will no doubt vie with each other in their pledges of devotion to the interests of the Canal. The result will be that the work will be forced upon the party leaders, although it is almost a certainty that none of them approves of it

Brockville

The Present State of Canal

At the date of the publication of this work the extent of the finished portion of the Trent Canal is 190 miles, the distance from Washago two miles above Orillia, to Healey Falls now available for navigation by vessels of 8½ feet draft. There is however in addition to this a considerable extent of inland navigation for the draft mentioned, by which wide strips might be taken such as to the picturesque town of Harris on Kawgeshewhe Bay on the western side of Lake Simcoe to Jackson's Point on the south shore of Lake Simcoe or at Lindsay on the Scugog River navigation further down the stream to Port Perry on Scugog Lake.

After more than seventy years of a chequered career the new locks on the Trent Canal are a means of through transportation from Georgian Bay at Lake Ontario will be an assured glimpse fair wealth the next few or five years. At the present time the centre of water from Healey's Falls to Trenton is under contract and the work is being advanced with vigour by the various contractors. The fact that the Dominion Government has this year set aside the sum of $1,750,000 for construction work on this and various streams that the energetic policy decided upon with respect to the early completion of the Canal will be carried out with the least possible delay. As a matter of fact it is regarded as extremely probable that several of the above mentioned contracts (there are seven in all) will be finished by the end of the present year. The contract for the next sec of Canal in the vicinity of Campbellford, which has been awarded to Messrs Hanna, Quinlan & Robertson is the heaviest undertaking on this division and it may be two or even three years yet before it is completed, and before boats may be able to travel from the land-locked waters of Lake Simcoe at the broad expanse of Lake Ontario.

It should be mentioned also that the locks, now under construction on the Healey Falls extension from Trenton to Healey's Falls and in fact extending up to Peterborough are being built so as to pass boats of 8 ft 6 inch draft. This will accommodate barges of 1,000 tons. It is intended that ultimately the Trent Canal will be deepened to accommodate vessels drawing 9 ft 6 inches of water with a minimum depth of nine feet between the locks.

However even with the comparatively small draft of vessels now in contemplation between Healey's Falls and Trenton through navigation will not be effected from Georgian Bay at Lake Ontario. There is yet a link placed under contract the section extending from Lake Simcoe at Georgian Bay a distance via the Severn River of 30 miles. This work on this section of the Canal is not considered very heavy consisting of the building of five or six locks and dams. The advocates of the early completion of the Trent Canal are hopeful that the Government may place this section under contract when the next year or months so that it may be finished concurrently with the Healey Falls Trenton Division, which by known as the Ontario-Rideau Lake Division) thereby completing within the next few years, a Canal that will afford a water route from Sault Ste Marie to Montreal shorter by 200 miles than that by the Welland Canal.

The Ontario-Rice Lake Division

In the annual report of the Department of Railways and Canals for the year ending March 31st, 1910, being the latest annual report of the Department to hand, is found some very interesting matter concerning the nature of the work that is now in progress in making the Rideau-Trent-Severn canal a few months of it from 4 inches 6 ft. then completing the northern out-et of the Canal. Mr. A. I. Grant, Superintending Engineer who is in charge of the work says:

The division embraces the fifty-six and a half miles of artificial canal between Trenton on Lake Ontario and Rice Lake which will comprise when completed also such a be f miles of canal in rivers and lakes of submarine channels, and thirty-four miles of deep river where navigation will be afforded. The rise between extreme low water level of Lake Ontario and normal navigation level of Rice Lake is 186 feet which rise will be overcome by 18 locks ranging from 9 to 27 feet in height. Fourteen concrete dams with steel-log stoppages will be required for the regulation of the river and in them 75,000 h.p. more may reasonably be developed at the low water range of the river than that quantity may be increased somewhat by a large expenditure in rock excavation. The normal summer water level of the central reaches of the river and Rice Lake will be about 247 feet above mean level of that practically no damage will be done by flooding the land along the river and lake shores. In the rapids the dams will hold the water at as high a level as practical while in the majority of cases, will be lower than the top of the river banks. The canals and channels with sides showing above water will have a minimum bottom width of 80 feet except in two cases of short reaches where the bottom width will be only 60 feet and the submerged channels will have a minimum bottom width of 100 feet which will be marked at frequent intervals by small piers. The canals and submarine channels will have a depth of 9 feet.

There will be sixteen bridges one of which will be for highways and not for railways. They will all be swing or bascule spans except that for the main line of the Grand Trunk Railway at Trenton Junction which will be a high level fixed bridge under which there will be a clear head room of 27 feet at a stage of 5 ft. above mean Lake Ontario.

The locks will be of concrete and will have 8 feet 6 inches of water on the sills with chambers 33 feet wide by 178 feet long between hollow quoins. They will accommodate be ges of 1,000 tons, whose draw will be about 150 feet long by 20 feet beam, and drawing 6 feet of water. Entrance piers of not less than 150 feet in length will be provided above and below each lock. The locks will be filled through culverts 6 feet wide by 5 feet high in the side walls, which will be equipped with wagon gates for controlling the water. The lock gates will be of the mitre type and the upper gates in all cases will be set at the top of lift walls. They will be operated by screws or bars working in lateral recesses without set in recesses, which will be formed in the lock walls.

The total cost of the improvement of this part of the Trent Navigation will amount to about $6,750,000, the first work for which was made by Parliament during the session of 1907. The project involves the removal of about one and a half million cubic yards of earth and a quarter million cubic yards of loose and soft rock, and the building of about four hundred thousand cubic yards of concrete.

Eighteen

As to The Future

THE attraction of the construction of the Trent Canal as a means of through navigation from Lake Huron to Lake Ontario are to-day more than ever manifested that when the waterway is completed it will be an important factor in the great carrying trade between the great west and the Atlantic seaboard. What it has, we recall a few years ago, received very little support from the large industrial centres of Canada as a united whole its results and which may not derive any immediate benefits from its completion is to-day with the great increase of wheat production and transport necessity generally speaking, rose via the hearty support of every section of the Dominion of Canada. The present Minister of Railways and Canals, Hon G P Graham, has displayed been earnest in the project and the work of completing the waterway has proceeded, under his administration with greater vigor than at any time in its history. A certain section of the great of Canada too, has in some been more or less loath a towards the project for those who have for years fought so determinedly in its behalf are hopeful that in a few years hence they will see barges, laden with grain from the great West passing down its course.

The old Erie Canal with its dead of a glory more than five feet can hardly in the matter of carrying capacity be compared with the Trent Canal with its depth of 9 feet 6 inches for the advocates of the Trent waterway point with pride to the part the Erie Canal has played in the transportation interests of the United States. It a period not that its inestimable benefits which have been derived from the Erie Canal is the best are disputed by any one. To it more than to any other one cause is due the phenomenal growth and commercial supremacy of the City and State of New York. It opened up the great West to settlement, and in turn attracted the products of the West to the big trade line through the Appalachian divide which counts many in the State of New York. The tolls on this waterway have more than repaid the cost of construction, maintenance and operation on and that it has paid over $380 000,000 00 of freight money with a the banks of the State and its subsequent of this money is reg the line of the Canal has built up the great interior cities from Boston be A large portion a enormous flux of commercial natron wh it has no country can a any other State. The growth of these Cit m a note led to the enactment of rail ways parallel ing the Canal and these by competition and scientific management have gradually reduced the cost of transportation with a the advantages such a reduction necessar y brings. With the completion of the Trent Canal no doubt a will transport on rates, goods to be carried to points along its route, but a good percentage of the grain that passes through the Soo Canal on its way from the West will be conveyed in barges by way of the Trent, to Montreal and the seaboard.

One of the most speeches that has ever been delivered on the practicability and desirability of the Trent Canal and its possibilities as a factor in through transportation was made by Mr E R Hall, who some four years ago represented West Peterborough in the Dominion House of Commons Mr Hall, who had given the Trent Canal and its future a most careful study a addressing the House on the matter amongst other things, said:

"The transportation of coal in the City of Peterborough last year was 45,438 tons. The rate on coal from Burlington Bridge to Peterborough by rail is $1 25 a ton. Coal is delivered at Orwego at 1d cents a ton cheaper than at Burlington Bridge. Freight between Orwego and Toronto is Port Hope at 25 cents a ton and the rate between Port Hope and Peterborough by rail though only a d stance of 36 miles is 90 cents a ton. On coal alone, the freight from Trenton to Peterborough were the Canal completed would not be more

Hall

than 25 cents per ton On that basis there would be a clear saving on coal to Peterborough of 75 cents a ton or on the amount consumed last year a total saving of $52,500

After dealing very exhaustively with the project *Mr* Hall concluded by saying

When you take into consideration the fact that we have the means right in the very heart of the Province of Ontario of constructing a 260 ton barge Canal which we have a country of carrying practically two and a half train loads of grain from Midland to Montreal I think you will admit that it is a matter deserving of the most serious consideration and that the Canal is a work which should be immediately gone on with as part of our national system of grain transportation

It will be observed that *Mr* Hall referred to the Trent Canal as a 750 ton barge waterway Since that time the Government decided on building the new section of the Canal with a draft of 8 feet 4 inches on the lockwalls thereby providing for the use of 1 000 ton barges. The Ontario-Rice Lake section of the Canal to be ng but with an 8 foot 4 inches draft, and any renewals that may be made from time to time on the older portions of the Canal will be on the same scale.

Photo/Source

As To Power Development

The Trent Canal as a producer of electrical power is doing much towards the industrial developments of th e centres of the province of Ontario. Roughly speaking, the various dams along the line of the Trent Canal from Lake Simcoe to Trenton are capable of developing 60,000 electrical h.p. Of course all the dams are not at the present time developed to this extent that this figure is not an yet able to stand a s all the power that is at night. However the demand is rapidly increasing and new dams along the canal are each year being developed and the towns and villages for many m es adjacent thereto are being supplied with light and power at low rates as the Niagara district, which is supposed to have the cheapest light and power in the province.

Every one has a water power along the route of the Canal with one or two exceptions has been assessed either by municipal boards or by private companies. The ownership of these powers was acquired many years ago and in construct ng the canal riparian rights were a matter that gave the Government considerable difficulty. However all matters of this kind are now adjusted and while the Government does not receive a re turn from all the water powers on the Canal, certain dams, however which were taken over by the Government and improved, are revenue producers in so far as the Government is concerned. The leases provide for those who by the power companies of the turn or wa er along the stretches of the canal have been served. It is estimated that the rentals from these water powers will very shortly be developed yield a revenue to the Government of Sixty Thousand Dollars per year.

The following tables give the locat on of the dams, with their respective lifts and hydro-electric power on the line of the Trent Canal:

FROM LAKE ONTARIO TO RICE LAKE

		at P
D&M No. 1.—3.7 miles from Trenton Junction. 18 ft. head. At extreme low water of Lake Ontario a head of 20.0 ft. can be obtained. With a 18.3 ft. head, the amount of h.p. developed is		3,927
D&M No. 2.—9.8 miles from Trenton. 20 ft. head		5,946
D&M No. 3.—At Glen Miller, 4.6 miles from Trenton. A 27 ft. head now be developed here on the present canal, and a company now at this time are Miller Bros. Limited who are now using a head of 9 ft. For this power. Manufacturing Co. Ltd. are developing a head of only 12 ft. and are using it. A 27 ft. head would produce		6,137
D&M No. 4.—3.8 miles from Trenton, having a head of 18 ft.		4,660
D&M No. 5.—8.6 miles from Trenton, having a head o 18 ft		4,660
D&M No. 6.—At Frankford, 9 mile from Trenton. 5 ft. head. The surplus water at this dam is the power by The Trent River Paper Company. There is developed here		2,646
D&M No. 7.—At Glen Ross, 12.3 miles from Trenton. By a large expenditure a money a head of 9 ft. at that dam could be developed. During high water the present head of 4 ft. at it a time may be somewhat increased. A 9 ft. head would produce		1,320
D&M No. 8.—At the foot of Myer s Island 16.4 miles from Trenton. A 60 ft. head can be developed a dam since by the excavation of about 37,000 cubic yards of rock for a tail-race and a 30 ft. head can be obtained at a still greater cost by tail race excavation from rock. There is a 60 ft. head available without any tailrace excavation. A 30 ft. head would give		1,327
D&M No. 9.—At the head of Myer s Island. The a n al 9 ft. head are little w h no expense a tailrace excava ion. With considerable m ore excavation a 24 ft. head can be obtained which would develop		5,954
D&M No. 10.—At Ranney's Falls, just below Campbellford, and 36.6 miles above the town of Trenton. A 48 ft. head is a course of development in the vicinity of Loch No. 30		10,580
D&M No. 11.— Known as Seymour's Rapids, just above the Town of Campbellford. The power at 48 ft. point is developed by the Seymour Power Company. There is a head at this point of 60 ft. Amount of power developed		9,917

Transcription

DAM No. 11—A dam at Coon Rapids. This power is developed by the Municipality of the Town of Campbellford. The head is 22 ft. Power developed is 5 000

DAM No. 12—At Healey's Falls, 14 miles below the Village of Hastings. A head of 76 ft. can be obtained at this dam by the expenditure of considerable money in tailrace excavation. This is considered the most valuable water power on the entire Trent system, and an order issued to the Supreme Court. Commission (The Electric Power Company Limited.) If the dam are developed be with a 76 ft. head will produce 13 000

DAM No. 13—At Hastings, owned and developed by the Public Company. There is a head of 8 ft. on it is slightly reduced during the high water season. A 4 ft. head will give 1,334

Total amount of h. p. available between Lake Ontario and Rice Lake 94,434

The flow of the Trent River from Rice Lake to Trenton is estimated at 450,000 cubic feet per minute. At Healey's Falls and Hastings the flow of the river is estimated at 300,000 cubic feet per minute.

FROM RICE LAKE TO STONY LAKE

DAM AT LOCKS, just below the City of Peterborough. This dam is not developed. It has a head of 8 ft. at low water, but during the 4 ft. water season this season discharging through the power a 6 ft. head. However a head of 8 ft. could be maintained and on the flow of the river at 80,000 cubic feet per minute, the amount of power available would be 1,060

DAM AT LONDON STREET, Peterborough, owned and developed by the Peterborough Hydraulic Power Company. The Quaker Oats Company 2,400

DAM AT AUBURN, owned and developed by The Peterborough Light and Power Company (The Electric Power Company Limited) 1,000

DAM KNOWN AS WATER STREET DAM, just above City of Peterborough, owned and developed by the City of Peterborough 2,500

NASSAU DAM, owned and developed by The Canadian General Electric Company 1 000

DAM No. 6 Peterborough-Lakefield Section. Lock 26 and developed by the Peterborough Power Company. This dam is one in No. 6, a 5 foot head on the electric can be profitably developed to produce 1,000

DAM No. 8—Owned by and developed by the Canada Cement Company 1,400

DAM No. 9—Not yet developed owned by the Canada Cement Company 2,800

DAM No. 10—Owned and developed by The Dackers Company at Peterborough 2,000

DAM AT YOUNGS POINT—Owned and controlled by the Canada Cement Company 900

Total h. p. on this section 19 960

In this estimate of the amount of available power on this section the figures furnished by the Ontario Hydro-Electric Commission are used, with the exception of the estimate on the dam just below the City of Peterborough and the Young's Point Dam. The Hydro-Electric Commission's estimate on the dams from Peterborough to Lakefield is considered to be very conservative, the flow of the river being reckoned at 54,000 cubic feet per minute. This power figure is composed that the low water flow of the river from Clear Lake to Rice Lake is 90 000 cubic feet per minute.

FROM STONY LAKE TO CAMERON LAKE

BURLEIGH FALLS DAM—Owned by The Electric Company. The Central Ontario Power Company). There is a head here of 30 f. Taking the flow of the river at 30 000 cubic feet per minute the amount of power that may be developed will be 2 000

ROCKHORN DAM—Owned by the Electric Power Company No. yet developed. A head of 10 ft. Taking the flow of the river at 70,000 cubic feet per minute, the amount of power available here would be 1 700

BOBCAYGEON DAM. Taking the flow of the river at 70,000 cubic feet per minute, with a 18 ft. head the amount of power available is 1,260

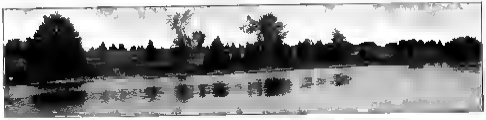
FENELON FALLS DAM. The surplus water at this dam is owned and developed by the Light Heat and Power Company of Lindsay. The head here is 24 ft. and the flow of the river is estimated at 40,000, giving electrical h. p. in the amount of 2,042
The total amount of h. p. on this section therefore is 2 960

Few people realize that the 100,000 electrical h. p. capable of to be developed along the Trent Canal from the Lake to Trenton, a repute is 1 000,000, one of coal for which we are paying the United States four million dollars annually

The 100,000 electrical h. p. above referred to does not include the power developed on the Severn River which flows from Lake Simcoe to Georgian Bay

VIEW OF RIVER NENE FROM STREET AT WEST WHARF PETERBOROUGH

VIEW OF THE ST BOROUGH'S OF [illegible] FROM RIVER NENE PARK SHOWING PETERBOROUGH
WHERE HIGH STREET AT LAMB INN



ENTRANCE VIEW OF [illegible] RIVER NENE PARK SHOWING PETERBOROUGH

As a Tourist Resort

THE route of the Trent Canal runs through a chain of lakes and rivers unsurpassed as the Continent as their varied attractiveness as tourist resorts. It is only in the recent years that these picturesque waters have been numerously used in the matter of being advertised as tourist resorts, but to-day there is not one available point or island on the lakes and rivers throughout the entire system that is not dotted with pretty summer homes and comfortable hotels and situated almost exclusively for the tourist traffic. The growth in the popularity of these waters as an ideal spot to spend the summer months, has been very interesting, and to-day they are receiving a degree of advertising by railway company, equal to that given the most select established by no mere attractions, resorts such as the Thousand Islands and Muskoka.

A certain section of the Trent Canal is commonly known as the Kawartha Lakes. Kawartha is the land so sung by Ernest Thompson Seton and Happy Leslie. They comprise fourteen beautiful lakes—Stoney, Sturgeon, Cameron, Balsam, Pigeon, Bald, Sandy, Buckhorn, Chemong, Deer, Loves, Clear, Stony, Clear and Katchewanooka—at which they may also be added Rice Lake, twenty-one miles down the Otonabee River below Peterborough.

The alternate of these lakes being broad and stately and of grand and picturesque beauty, and then again narrow, and in places almost like a river, charming scenery the pleasure seeker will find delightfully one wooded shores and sandy beaches, where bathing may be indulged with safety.

The accommodation for travellers at the various points on these waters is much superior to the average summer resort. For those who wish to take their family for an outing, the cottages in many of the shores of these waters affords a vacation at a very moderate expense. The hundreds of miles of shore and the many islands of the Kawartha Lakes completely land themselves in the enjoyment of a summer outing. The Kawartha Lakes lie at the line of the Trent Canal, are linked together by narrows locks and channels, which gives the host of the pleasure seeker to pass from one to another until the whole circle is explored. The eye never has time to weary of one scene before the rounding of a point the passage of a lock or the entering of the narrows puts before you a new prospect. The city of to-day the scene of a public lecture by one of a few or the hurt of a pic nic when is enough to bring a fresh section of the Kawartha panorama into view.

These Highland Lakes of Ontario are like, and yet unlike, the Scotch lochs. They do not possess the awful grandeur of those of Switzerland nor the cold magnificent scenes of the Scotch lochs, yet there is about them an expression more subdued and peaceful, while every point and island every bay and head and grove with a serenity picturesque beauty. Slowly threading a narrow passage between sentinel pines at the rounding of a point, it will suddenly burst upon you a broad expanse of water whose calm loveliness shuts soon to have an orchard but hidden behind some island or projecting headland will be found a passage leading through another expanse of beautiful scenery and just as further progress seems impossible, another miniature sea breaks on the view.

Lovely as were the Kawartha Lakes when Nature displayed them in advantage before the enthusiastic gaze of Samuel de Champlain and his followers, the new hand art that Nature has did improved by the artistic hand of man they are simply enchanting. Travellers in Scotland or readers of Sir Walter Scott's or other descriptive works of The Scotch Highlands are not unfamiliar with the wild grandeur of the Scotch lochs and all this magic likeness is reproduced within the confines of the Kawartha Lakes. The once the scenery is studied the more is noticed and becomes that the charms which are spread out under a Canadian sky can not be with the most lovely which are scattered in the distant climes. The student of geology the botanist and the amateur photographs find a field well worth while in the Kawartha country.

As fall by naturalist, the midland district of Ontario is one broad continuous network of lakes extending to James Bay and the voyages to be taken by the enthusiastic lover of the names have but one limit—the time in the disposal of the voyager.

Peterborough

The Hydraulic Lift Locks

In attempting to describe the hydraulic lifts on the Trent Canal we can not do better than to reproduce a few extracts from a paper prepared by Mr Walter J French C E (Tor Univ.) M Can Soc C E. Mr French at the time of the construction of these locks, was in the service of the Department of Rys were and Canals and had immediate charge of the work. In January 1907 Mr French read a paper at the annual meeting of the Canadian Society of Civil Engineers at Toronto, from which the following account of the Peterborough Lift Locks and Canada. While space will not permit of our using this article in its entirety it is hoped that the extracts taken therefrom and published below will give the reader some slight idea in brief, of the hydraulic lift locks on the Trent Canal. Mr French said a part

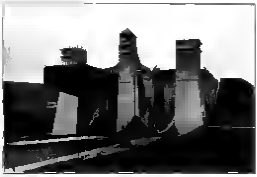
Has it for the Canadian Government by Canadian contractors, under the direction of Canadian engineers, the hydraulic locks on the Trent Canal may properly bear the label Made in Canada. In view of the fact that the German Government has recently completed a high canal lift at Hohenheimburg and that the United States Government has made a careful study of the problem of mechanical lifts in connection with the reconstruction of the Erie Canal, a detailed description of the Canadian hydraulic locks may be considered appropriate at the present time.

The largest of the two Canadian locks is situated on the Trent Canal within the limits of the corporation of the city of Peterboro, and has been in operation since June, 1904. The other lock near the village of Kirkfield is in a section of canal joining Balsam Lake and Lake Simcoe.

The hydraulic lift is theoretically an automatic machine and is developed to take the place of ordinary locks where a great difference of level is found in a short distance. Besides the Peterborough and Kirkfield locks, there are three other locks of this type in operation one being in England another in Belgium and the third in France. The English lock has been in continuous use for over thirty years, while those in France and Belgium have been constructed about ten or twenty. They all have a lift of nearly fifty feet. The chief water at the French and Belgian locks a 7 foot 7 inches, and the tank chambers are 140 feet long and nineteen feet wide. Sawyer chutes having similar dimensions are now being built for the Belgian Government. The chief dimensions of the Peterborough Lock are its great lift, namely 65 feet 10 feet ong, with 33 feet 6 inches depth of water. The Kirkfield lock has the same general dimensions with a lift of 48 feet. It will be noticed that in the Peterborough lift the water head is double that of the longest European ones, while the length of the lift is increased over thirty per cent.

In principle the hydraulic lock may be likened to two immense hydraulic elevators of the simple plunger type, having their pressure connected together so that the descent of the one causes the rise of the other. In place of the ordinary elevator platform we have a large watertight box or tank closed at either end by a gate. The exchange is performed by towing the vessel into this box of water and then closing the gate on the end of the box, as well as that at the end of the canal thus leaving the box independent of the reach and free to move vertically. The box with the water and the floating vessel is then raised or lowered to the other reach. The chamber or box when so raised or lowered with a few inches more water than the other chamber thus giving it the necessary additional end or surcharge to enable it to cause the ascent of the other when water communication is established between the two pressure. The construction of the Canadian locks varies materially from those of Europe, and so far as our water supply goes, there is little similarity. The departure are largely due to the different site conditions and is the different practices adopted by American and European engineers in steel construction.

For purposes of detailed description the Peterborough lock will be taken first and that at Kirkfield in the latter structures will be noted later in this paper



THE [illegible] TERMINUS HYDRAULIC [illegible] LOCK [illegible] FROM THE WEST

A graphical sketch was selected for the site of the Peterborough lock, and the excavation was completed in 1899. The section was chosen so that the average depth of excavation was about 40 feet, and the excavated clay obtained was used in building embankments to carry the level of the upper reach to the back of the entrance. The excavated material was found to be hard clay mixed with small stones and boulders, underlying a thin layer of Lias; a wall at the upper end of the excavation a small amount of hardpan was encountered and below this a shaly limestone rock. The rock was in layers of from ½ inch to 8 inches in thickness, between which were thinner layers of clay and shaly material. The layers of crystallized limestone caused the greatest quantity of waste, but the shaly parts of material were rapidly under the whould of rain and frost. The excavation as would rock was found was exceedingly fortunate, being practically at the bottom of the pits. When the rock was cleaned off from three feet of concrete through the floor to its proper grade. No footings were required under any of the walls, all being laid upon the solid rock.

As a dwelling is dealt with the excavation of the grass we a in which the large pressure stand. Mr. Francis, paper gives a description of the substructure of the lock. It is built entirely of concrete and contains a little over 28,000 cubic yards. The lower wall is forty feet thick and 80 feet high the angle being 136 feet at the base. The towers, three in number are the same transverse centre line as the walls. In round numbers, the total height of each tower from rock bottom to top is 160 feet.

The earth embankment upon which the canal is carried up to the back of the lower wall was built in layers about 8 inches in thickness, thoroughly compacted and rolled. During the hot and dry season the earth filling was partly watered. The material was clay containing small stones. This method produced an embankment having the remarkable record for settlement of only about 1 ½ feet in a period of nearly a year when the depth of made earth was upwards of forty feet.

The contract for the substructure and superstructure was executed by Messrs. Carry & Lamothure at Ottawa, and completed in 1902.

Dealing with the superstructure Mr. Francis says:—

The superstructure of the Peterborough lock was built by the Dominion Bridge Company at Montreal. The work was commenced in the summer of 1901 and the structure was completed early in July 1904. The cost of the superstructure complete was $344,000.00.

Each of the lock chambers is 150 feet x 33 feet with 8 feet 10 inches of planting on the sides. These dimensions, with the exception of the depth of water were fixed by a Government Canon size. It was necessary that a clear headway of 24 feet be left above the water level. The depth of water for which the lock is constructed would a ordinary navigation navigation, be called 9 feet on the sills. The sill of the gate which each of the lock chambers contains is 8 1000 feet and the water minimum load which is necessary to provide for sixty a floating vessel displacing only her own weight of water.

The structural steel work we submit is described by Mr. Francis, as well as the gates and their mechanism and the main pressure and ramp. After substructure and before erection all the castings of the pressure were subjected to a rigid hydraulic test at a pressure of 1,200 lbs per square inch being twice the working pressure.

As to the materials and general appearances Mr. Francis says—

A summary of the amounts and various kinds of metal used in the superstructure is as follows:—Rolled steel in plates and shapes in the lock chambers and gates, 1 840 000 lbs. cast iron in recess accurate and gates, and various machines, 496 000 lbs. steel castings for the main pressure and accurate and, 668, 000 lbs.

Care has been taken throughout to obtain the general appearance of the work as attractive as possible. All the wall and stairways are protected by suitably designed railings and the windows and doorways are shaded by ornamental grille work. The lockmaster's cabin on

the top of the centre frame is constructed of concrete as high as the window sills. Above this the steel frame work is framed with wood and the whole of the exterior covered with copper. The interior is finished in British Columbia oak in its natural color.

Many people who use the hydraulic lift are under the impression that it is necessary to know how the speed between the lock chamber and the frame of the reach gate is made water-tight. Mr. Fratelli says that this

There is a space of nearly 2 inches between a steel angle on the lock chamber and the frame of the reach gate. When it is desired to connect the lock chamber with a reach this meshing space has to be closed. This is done by forcing a collapsible rubber tube fastened to the frame of the reach gate and arranged so as to fit into it. When the lock chamber is in position for communication the rubber tube is inflated with air at about 75 pounds per square inch pressure, which causes it to expand and press against the end of the chamber.

The operation of the lock is described by Mr. Fratelli as follows:—

The operation of the hydraulic lock rests on three men—a lockmaster and two assistants or gatemen. The lockmaster is in charge and is responsible for the structure. Two gatemen are required—one at the lower end and the other at the upper. In open and close gates, an intimate relation between the operators is necessary. The gatemen also take charge of vessels in about 200 feet on either side of the lock. The lockmaster during operations stays in his cab on the top of the tower tower and has full view of all the navigation. He is also in communication with his two assistants by a radio signal system. The lockmaster has before him the principal levers, and through an interlocking system regulates the working of the locks. The levers for control ing the gate engines and the caissons are situated on the wall immediately above the respective manhattan entrances and all access to the gateman. The interlocking system is so arranged that the lockmaster must set his levers in proper order and these having been set neither he nor the gatemen can err by using their levers in the wrong direc-

In order to get a clear idea of the complete mode of operation let us assume that both lock chambers are down at the lower and empty as they are at the end of winter or when it is desired to prepare them for navigation for passes. The annular space in each of the caissons is empty as he filled with water. The main air on the connecting pipe will be closed and water will be pumped into one of the caisson into the pipe, with its superimposed chamber rises in the axis of the upper reach. An examination of the case will show that as water rises the uppermost chamber or order that I shall be able to descend or to cancel the effort to take the full upward tension, must contain a volume of air greater than is the eq. chamber contains. This extra amount is equa to the column of one of the rams, a size the engine that raises piston during the ris in vo motion of the two chambers is therefore ram of the descending chamber becomes pressure is immersed while the other proceeds. In other words, the descending chamber is being weight will be in ascending is constantly becoming heavy or. It is an accessory the same extra weight be provided to to overcome the friction of the guides, and of the counter boxes of the main pressed. The area of each lock chamber is so great that it requires only an additional depth of 8¼ inches an give an extra ton of water of 100 tons which is made as for ordinary operation. The addi on to this weight of of course, has the effect of accelerating the loss of the rate as change in position of the chamber. The ordinary ities required a raising the chamber through the wha e elevation of about two minutes. But th a w I depend upon the adjustment of he main glands the nicety of the work rq. of the gates and the manipulation of the main valves on the hands of the lockmaster.

An ord nary discharge is condensed in the manner. Suppose 100 tons of surcharge has been found to give sufficient addi onal weight to the descending chamber. The uppermost chamber will then be required as step w ds in floor 8¼ inches lower than the bottom of the upper reach. On communication being esta lished with the reach surface was from the reach 100 tons more than the lower chamber outw rd, simultaneously depth in both reaches is be the same. Then the total expansion to make the bearings of the gates adjoin ng the reaches are

opened and the sea tubes are inflated, contents in hauling the vessel into the chamber and mooring her there securely closing the gates, deflating the seal tubes and opening the main valves between the pressure The heavier chamber then commences to descend, the vessels being allowed to descend gradually by the gradual opening of the valves until a reaches the maximum speed About three-quarters of its stroke the main valves are slowly closed communication between the pressure being entirely cut off when the end of the journey is reached The change in elevation being made, the sea tubes are inflated the gates are opened, and the vessel or vessels are free to go on their journey after being towed out by the engines The surcharge contained in the descending chamber ships locks out into the down reach, while a similar quantity is perform the next leakage is admitted into the chamber which has just reached the highest elevation

The record leakage so far is the Peterborough took in 6¾ minutes, being the whole time from the stopping of the vessel in the west reach to her proceeding on his journey underher own steam in the upper and

The Reservoir Waters

THE Trent Canal district may be said to have its plained to Ontario the first real practical demonstration of the value of water conservation While the Trent Canal has been heard of for many years and has, at its day completed a sort of political football with which perhaps both all the great no local parties have played—Tory, at the same time as a canal a waterway for the transportation of the products of the country that it has been advocated and to which it has inevitably been referred. This waterway which, when completed will run through the rich and counties of Ontario connecting Georgian Bay with Lake Ontario at Trenton consisting a route for barges of 8 feet 6 inches of depth for by 25 m ted shorter to Montreal than by the Welland Canal In no reality running completion it will therefore be a matter of a short time only until the advocates of this route will have an opportunity of demonstrating to the world if they can that this Trent Canal projected nearly 15 years ago can carry ore from Highland to Montreal at cheaper rates and in faster time than by the Welland route

However it is not along this line that I am now going to discuss the Trent Canal has rather as a source by which electrical power has been developed along its route and the future it is playing in the industrial development of Ont d strict Near to the Niagara there is no district in older Canada at least in which the water falls are be ng developed to a greater degree than along the line of the Trent Canal There has been a number of creeks undeveloped dams on this waterway for many years back at which power has been to a limited extent developed In has been during recent years only however that the great possibilities of power have opened on the Trent Canal have been fully rea ed Efficient and modern power houses are now forming up at the various dams and the district threatened as becoming a network of power transmission lines

Th n is due to two ma n reasons Firstly it might be stated that the first adoption the cities have the Canal should take at certain points, and the canal on all substantial new concrete dams by the Dominion Government for Cata purposes made many storable areas available for the developments of power These dams are n the present time, possess y a storage of from feet Most of them are already being used n the development of electrical and by and the remainder of them are about to be utilized They are owned by various private power houses stock companies and municipalities The nature of the ir ns is, and power privileges is connected with these dams vary considerably Some of them are owned outright by private ind viduals and hey are entitled to all the surplus water without any yearly rental By private ind viduals and hey are entitled to all the surplus water without any yearly rental The dams then field were secured many years ago a time before a canal was seriously thought of or before the value of water powers was understood Other dams are owned by leased from the Government (the terms of the leases varying upon payment of a sor ain annual rental now being based of course upon the amount of powe developed Such forms as those are now placed under the control of the Railway Commission in so far as the matte of rates to consumers of power is concerned Thus was a very wise move on the part of the present Minister of Railways and Canals, as it ensures to the public the delivery of power at a reasonable price

But the remarkable development of electrical power on the Trent Canal is not due to this alone The flow of the Ottawa and Trent Rivers on which the great portion of the power is developed has by a judicious and aggressive policy of conservation been increased to such an extent that it has contributed perhaps to a greater degree than the construction of new dams to the present high y satisfactory rate of efficie and has ed really a no centralized to the development of the towns and villages along the route of the Canal When it is realized that the flow of the Ottawa River at Pembroke has increased over 100 per cent during the past five years, one can realize that water conservation on the Trent Canal has been a reality

Until five years ago, the waters of the Trent Canal and the waters of what is known as the Trent Canal watershed were under separate managements. That is, the main lakes and rivers of the system in the Trent Canal proper were under the control and management of the Dominion Government while the feeders thereto were under the control of the Government of the Province of Ontario.

It must be borne in mind that the County of Hastings and those portions of the counties of Peterborough and Victoria north of the main line of the Canal, contain myriads of countless lakes of various depths and sizes. A glance at a map drawn on a reasonably large scale, on which those lakes are shown would undoubtedly surprise one as he is not persons by their relative proximity. Some of these lakes are quite large, Redstone for instance, in the township of Cardiff, having an area of 3,087 acres. Kasshagog in the township of Hawkesbury having an area of 3,833 acres, and Clear Lake, in the township of Lanark-north having an area of 2,745 acres. These lakes empty into streams streams that bring discharge into the Trent Canal. The two of the largest of these are known as the Gull River which flows into Balsam Lake at Coboconk and the Burnt River which is a head waters to Cameron Lake, just above Fenelon Falls.

However there are other streams that are valuable as feeders to the Trent Canal a full list of which together with the areas in square miles of their basins is as follows

	Acres		Acres
Gull River basin	10,564	Bear Bay Creek basin	2,542
Burnt River basin	22 950	Buckhorn Creek basin	955
Ningo Creek basin	4 677	Squaw River basin	341
Mississagua basin	7 692	Jack's Creek basin	4 765
Eels Creek basin	2 883		
		Total	83,310

This form not include the Crow Bay waters, which empty into the Trent River below Healey's Falls. Crow Bay waters are still under the control of the Ontario Government.

During the year 1918 an agitation was started by the power users along the Trent Canal as well as by the navigation interests, to have the control of above-mentioned watershed or what is now common ly known as the reservoir system transferred from the Province of Ontario to the Dominion Government, in order that there might be one head to deal system of management in connection with the water for the Trent system through the Government of Trent waters on the main line of the Canal. Until that time the normal flow of the Otonabee River at Peterborough was 44 000 cubic feet per minute. There was no uniform flow of water for the season and it was practically impossible to enter the canal at that existing, to control it

At certain per ods of the year—during the spring and early summer—an unnecessary amount of water came surging down the Otonabee and Trent Rivers, which by the month of August there was no enough water to form the wheels of the electric power houses on the Canal or supply the requirements of the navigation interests. The state of affa rs was due to the fact that there is charge of the tributary waters had no interest whatever in these streams, other than to use as the battlement in getting out their logs. The Ontario Government had built number dams at the outlets of many of these lakes which were controlled by the Provincial Department of Public Works. The dams are built and operated in the interests and for the sole benefit of the lumberman. When the lumbermen's logs in their out of the various lakes, there would be an abnormal and unnecessary flow of water came down into the rest of Canal. This step logs would remain out until the following spring, when the same process was gone through

It was argued and quite properly so, that if the entire system of the Trent Canal, watershed logs, water and the water in the main line of the Canal, were placed under one management, a system of conservat on could be inaugurated whereby without any interference with the rights of the lumberman a steady and increased hor cou d be made to pass down the

Ouseburn and Trent Rivers as all seasons of the year. I was of course contended that the control should be vested in the Australian Government in view of the requirements for navigation purposes. After some months of negotiation, in which prominent men of the district, regardless of political creed, took part, the mandate to the Dominion Government was made on July 1905 the Provincial Government handing over all lakes, rivers, and streams tributary to the Trent Canal north of Peterborough. The Dominion Government agreed to protect the rights of the inhabitants in respect of the use of dams on those streams and guaranteed to them all privileges they had hitherto enjoyed.

The Department of Railways and Canals, under whose control this splendid waterway now comes at once got busy. Money was voted for the repair and building and improving of the dams & the outlets of those various lakes. The old timber dams were a many instances replaced by substantial concrete structures. Officers were reported and lighteners and in nearly every case the dams were raised by many feet over their former level. On the various streams good competent, and experienced men were placed in operate the sleep-locks at the different dams and an almost perfect system was built up. The result of the work is there for most surprising. The vats is now conserved so the freshets the Trent river are taken up and with care, and by using only what water may be store utely required. The sleep-ups are immediately replaced after each drive passes and the water is herded up until such time as it may be required in the late summer or fall months on the trent Canal.

The beneficial results are clearly illustrated. The flow of the Silver Ouseburn was at present to 89,000 cubic fee per minute, being less what the flat it was five short years ago. Power development of each dam has co respondingly increased, and more power is secured supply available for distribution throughout the district.

I may be borne in mind that the system is not yet expanded to the full limit of its possibilities. Each year more new reservoir dams are being built and for some years to come there will be scope for still further improvement. An extreme dry spell may to some slight extent, use the present greatly increased capacity of the various power plants yet dams to pass a greater company operating on the Trent Canal especially from Peterborough down that with use my that the flow of water on the Trent Canal has been steadier more uniform, and 25% per cent greater throughout the entire year that it was five and six years ago.

There is no doubt therefore that water conservation in this district has been successful to a most surprising degree. There is no doubt also that the successful working out of this policy has cost but in great industrial growth which is as yet in its infancy for the reason that many of the best dams of the Trent Canal are only now being harnessed while a water to supplying the very attractive market with its surplus.

I am only late in say that the success of this scheme is in a very large measure due to the superintendent of the Canal Mr. J. H. McClellan, who has given the matter a thorough study and has materialized throughout that degree of enthusiasm with which he came years ago entered upon the work.

HIS MATERIAL IS ARCHIVAL MATERIAL HELD IN THE CAMAS RESERVED COLLECTION

188,465 Acres of Water

IT may surprise many to know that the area of the various lakes that form the portion of the Trent Canal from Balsam Lake to Trenton is 88,079 acres. To this may be added the area of what is commonly termed the Reserved Waters and which is 99,359 acres. This, therefore, would mean that our area of no many fairly large rivers and streams does not 88 438 acres of water flow ng continuously from through the Trent This area is made up as follows

RESERVOIR WATERS

	ACRES		ACRES
Gull River basin	40 884	Jack's Creek basin	4 188
Burn River basin	22 807	Crow River basin	16 148
Eagles Creek basin	1 871	Deer Bay Creek basin	2,842
Mississaugua basin	7 032	Buckhorn Creek basin	955
Eel s Creek basin	2 883		
Squaw River basin	341		98,368

	ACRES		ACRES
Balsam	10,330	River Buckhorn to Bartlight and	670
Cameron	3,100	Deer Bay	4 140
Sturgeon	16 000	Stony and Clear	18 874
Six gues	9,350	Rice	17 000
Pigeon	6,004		
Chemong	5,400		88 079
Buckhorn	4 000	Total	88 438

Of course, Lakes Simcoe and Couchiching, which are on the use of the Trent Canal have an area of 283 square miles Their waters, however how through the Severn River into Geo gian Bay and also flow ng over Niagara Falls join their neighboring waters of Balsam Lake in the Bay of Quinte

The Crow R ver basin of 1 48 acres flows into the Trent Canal just below Healey's Falls. The Superintending Engineer of the Canal in his annual report to the Department, estimates the low water flow of the Trent River be ow the point at wh ch the Crow R ver basin enters at 2,000 cubic feet per second wh le at Healey s Fa ls h s ow water estimate is 1 400 cubic feet per second

The Charts Explained

In making a trip over the Trent Canal yachtsmen and others who may desire to refer to the charts here n, will observe that these sheets have been arranged in the following order

1 Chart of Lakes Couchiching and Simcoe.
(From the entrance to the Canal near Severnson to Balsam Lake, no chart is required the channel in going the Talbot River is some distance and the remainder of the 6 stance being through an unbroken reach)

2 Chart of Balsam Lake and Cameron Lake
3 Chart of Sturgeon Lake
4 Chart of Pigeon Lake.
5 Chart of Buckhorn Lake and Chemong Lake
6 Chart of Deer Bay and Lovesick Lake from Buckhorn to Bartlight
7 Chart of Stony Lake and Clear Lake
(The channel from Young's Point to Peterborough through Lake Katchewanooka and the River Otonabee is easily located without the aid of a chart.)
8 Chart of Crowe bee River and Rice Lake

Flowing Wells

Height of Locks

The following table gives the location of the locks, with the [illegible] upstream lifts, on the Ontario-Rideau Lake Section now under construction

NO. OF LOCK	MILES FROM TRENTON	LOCALITY OF LOCK	A. FT. OF LOCK
1	1 6	Trenton Junction	20 ft
2	2 4		20 ft
3	3 4	Glen [illegible]er	27 ft.
4	5 2		18 ft
5	5 4		18 ft
6	7 3	Frankford	18 ft.
7	13 5	Glen Ross	5 ft
8	25 2	Percy Landing	20 ft
9	26 4		18 ft.
10	27 8		24 ft.
11	29 8	Ranney Falls	6ft ft
12	29 8	Ranney Falls	25ft ft
13	33 1	Campbellford	25 ft
14	33 6	Meyers Falls	25 ft
15	36 1	Crow Bay	26 ft
16	36 5	Healeys Falls	27 ft
17	39 5	Healey Falls	27 ft
18	51 5	Hastings	5 ft

I will be seen by the above table that the total lift from Lake Ontario to the mouth above the Hastings locks is 388 feet. The new locks at Burleigh, replacing the old lock built about the year 1837 was thrown open to traffic this spring and there is now again through navigation to Healey's Falls

The following table gives the location of the locks, with their respective lifts, on the navigable portion of the Canal from the Otonabee River below Peterborough, to Balsam Lake, the summit waters of the Trent Canal

	WIDTH OF LOCKS	DEPTH OF WATER	DEPTH ON SILL	LIFT
Lock 1 Peterboro	34 ft	33 ft	7 ft	7 ft
Lock at No 8 Peterboro Lakefield Division	42 ft	33 ft	7 ft	16 ft
Lock at Peterboro hydraulic [illegible] ock No. 1	40 ft	33 ft	6 ft.	65 ft
Lock at No 5 Peterboro Lakefield Division	142 ft	33 ft	6 ft	8 ft
Lock at No 4 Peterboro Lakefield Division	142 ft	33 ft	6 ft.	8 ft
Lock at No 3 Peterboro Lakefield Division	42 ft	33 ft	6 ft	12 ft
Lock at No 2 Peterboro Lakefield Division	42 ft	33 ft	6 ft	9 ft
Lock at No 1 Peterboro Lakefield Division	142 ft	33 ft	6 ft	10 ft
Lock at Young's Point	134 ft	33 ft	6 ft.	6 ft
6 Locks at Burleigh each 11½ ft (Upper Locks)	134 ft	33 ft	6 ft	
	150 ft	33 ft	7 ft	32 ft
Lock at Lovesick	134 ft	33 ft	6 ft	8 ft.
Lock at Buckhorn	134 ft	33 ft	7 ft	8 ft
Lock at Rotherglen	134 ft	33 ft	7 ft	7 ft.
2 Locks at Fenelon Falls each 12 ft (Upper)	134 ft	33 ft	7 ft.	
(Lower)	150 ft	33 ft.	7 ft	24 ft.
Lock at Bobcaygeon	170 ft	33 ft	7 ft	4 ft. 4 ft

It will be observed that the lift from below the City of Peterborough on the Otonabee River to Balsam Lake is 222 feet

Percy

The following table gives the location of the locks with their respective lifts, also meeting Salmon Lake and ascending to Lake Simcoe

	LIFTS & TWN'S	HEIGHT	WIDTH	DEPTH ON SILL	LIFT
1 at Kirkfield hydraulic lift lock No. 2		140 ft	33 ft	6 ft	31 ft
1 at No 1 Simcoe-Balsam Lake Diamond		142 ft	33 ft	6 ft	21 ft
1 at No 2 8 miles Balsam Lake B views		142 ft	33 ft	6 ft	14 ft
1 at No 3 Simcoe-Balsam Lake Division		142 ft	33 ft	6 ft	14 ft
1 at No 4 Simcoe-Balsam Lake B views		142 ft	33 ft	6 ft	16 ft
1 at No 5 3 miles-Balsam Lake F vedas		142 ft	33 ft	6 ft	11 ft

It will be observed that Lake Simcoe is 24 feet lower than Balsam Lake

The Cost of Construction

The following table shows the amount spent each year and the total amount spent to the 31st March 1910, on the Trent Canal also gauges on Capital Account

Construction expenditure			
prior to Confederation	$ 588 371 34	1896	58,967 70
1876	161 60	1896	342 876 95
188	——	1897	488 526 70
1882		1898	351 273 21
1883	40 767 16	1899	334 885 0
1884	120 365 61	1901	284, 593 64
1885	121, 382 84	1902	649 076 49
1886	75 103 30	1903	823,950 74
1887	170 561 65	1904	480 036 44
1888	114, 972 35	1905	333 96 75
1889	47 192 15	1906	318,788 48
1890	59,644 50	1907	153 045 42
191	8,826 40	1908	243 176 05
1892	9 407 28	1909	1 009 836 36
1893	5 662 47	1910	1 900 000 00
1909	3 4 2 32		
		Total	$7 873 501 09

Some Distances

The following table of distances on the Trent Canal may be found both useful and interesting

	MILES
ON MAIN LINE OF CANAL	
Port Severn to Washago, via Severn Bridge	31 0
Washago to Barrows	16 0
Narrows to Gamebridge	16.0
Gamebridge to Balsam Lake	16.0
Balsam Lake to Kenedy's Fever	5.0
Rosedale Bridge to Fenelon	4 6
Fenelon to Bobcaygeon	14.5
Bobcaygeon to Southorn	10.5
Southorn to Burleigh	7.0
Burleigh to Young's Point	9.0
Young's Point to Lakefield	8.0
Lakefield to Peterborough	13 0
Peterborough to Rice Lake	21 0
Rice Lake to Hiscott's	12.0
Hiscott's to Hastings	6.0
Hastings to Trent Bridge	8.0
Trent Bridge to Healey's Falls	6.2
Healey's Falls to Campbellford	6.14
Campbellford to Chisholm's	17.0
Chisholm's to Grafton	6 0
Frankford to Trenton	7.0
ON CHEMONG LAKE	
Chemong Park to Buckhorn	13.5
Chemong to Bobcaygeon	16 70
ON CLEAR AND STONY LAKES	
Young's Point to	
End of Clear Lake	4 0
Juniper Island Store	6.0
Bonchuk	9 0
Crow's Landing	12.0
Head of Lake	16.0
Juniper Island to Burleigh	2 35
Crow's Landing to Burleigh	6.0
ON OTONABEE RIVER	
C P R Bridge to G T R Bridge (Peterboro)	1 50
Wolfe St Wharf to lower end of Peterboro Lock	1 40
Wolfe St Wharf to Nye's Boat House	1 75
Lower End Peterboro Lock to Crawford's Grove	1 37
Wolfe St Wharf to Crawford's Grove	2 77
Wolfe St Wharf to Hale's Bridge	6 50
Peterboro Lock to Hale's Bridge	5 40
Hale's Bridge to Scribner Bridge	3 90
Wolfe St Wharf to Westlock's	15.70
Wolfe St Wharf to Jubilee Point	21 20
Wolfe St Wharf to New Co	21.90
Scribner Bridge to Westlock's	6.80
Westlock's to Jubilee	2.50

ILLUSTRATION NO. 22
THIS IS ONE OF THE REMOVED DAMS ON THE ERIE CANAL WATERSHED

[illegible] ON [illegible] WAYNE-LAKE SIMCOE SECTION

FACULTY OF ARCHITECTURE
LANDSCAPE AND DESIGN
LIBRARY
UNIVERSITY OF TORONTO
230 COLLEGE STREET
TORONTO, ONTARIO M5T 1R2

ORILLIA

In view of the commercial importance of the construction of the Trent Valley Canal it is natural that the attention of business interests in this great project should be riveted on the Town of Orillia which is rapidly becoming the great Industrial Centre of Northern Ontario. Orillia, which is situated on the western shore of Lake Couchiching, and which also overlooks Lake Simcoe has quickly developed into a town of importance. Its location and the push enterprise and energy of the townspeople have brought about a situation to make it what it is. Orillia is progressive picturesque and healthful town of 11 thousand five hundred people. Has the least rival in point advantages in her easy accessibility to and her ease in getting and transportation facilities. Three great Railways now run through the Town. The Grand Trunk The Canadian Pacific and The Canadian Northern with which we will mean and does mean for her future ease as transportation route with the Atlantic seaboard and the West. As an example of the enterprise of this citizens Orillia was the first Municipality in Ontario to develop a Water Power and Install an Electric Power Transmission Plant which has been done in 1899 in the form a Hydro Electric System now run by electricity. A low and special rate is offered to all industries and many of those have been brought here through the attractive power rate. From this Plant twenty two hundred horsepower is now being used at all present time for Municipal and Manufacturing purposes, and one thousand horse power is now being offered There are one thousand men employed in the various factories. The Tudhope Motor Carriage company employ three hundred men. The Tudhope Carriage Company two hundred. The Canada Iron and Steel Company installed their new plant in the town in the fall of 1900 and a new enlarging here plan as at can double its capacity. The Canada Wood Specialty Co. Lang Manufacturing Company The Rama Plate Ag Factory together with various other Manufacturing Concerns are all running to their full capacity and contemplate extending their plants. These and other industries have shown growth for its years and during the late year the population increased by more than seven hundred the filling all unused lands is going on every direction and there have recently been laid out over one-quarter of a million dollars worth of building and improvements in the town within the town limits during this season. The optimist expects Orillia in navigated late town census during and next five years and to have become the Industrial City of Northern Ontario.

From a Summer Resort standpoint the town is well known and her principle charms arise from her situation on the two beautiful lakes Couchiching and Simcoe. Lake Couchiching is about six miles wide at its largest and five miles in width and considered beautiful islands. The whole region is full of scenic beauty and is a delight to all lovers of nature. One of the principal attractions of the town from a Summer Season standpoint is her splendid Minute town Hall Park known as Couchiching Beach Park, which also forms the recreation ground for the townspeople and tourists. Boating is one of the favorite pastimes in Orillia and her canoeists, sandy canoeists, sail ng craft and motor boats are everywhere in summer. Tennis has many devotees and certain courts are found on many of the private lawns. For those fond of golf there are excellent golf links and these are patronized daily by a large following Orillia is a town of well-shaded streets of exceptionally fine homes, of beautiful lake views and of fine churches schools and civic buildings. On the shores of the also are situated the summer homes of people from Canadian and American cities Some come from as far south as New Orleans

Orillia with the two-fold advantage of being an industrial and railway centre as well as summer resort must become one of the most important towns along the route of the Trent Canal Lakes Simcoe and Couchiching form a link in this great waterway system and both empty into the Severn River which will be the outlet of the Canal to the Georgian Bay Surely such a grand location on the junction of the Trent Canal and the three Transcontinental Railways must give promise of a greater future for the already progressive, attractive and flourishing Town of Orillia.

The Town of Barrie

IS situated at the head of Kempenfelt Bay Lake Simcoe in shape resembling a horseshoe It is the County Town of Simcoe, Province of Ontario, and has the County Municipal Buildings, and Law Courts. BARRIE is on the main line of the Northern Division of the Grand Trunk Railway, 62 miles north of Toronto and is the divisional point of five branches of the G T R BARRIE has a service of 16 trains arriving and leaving daily and numerous heavy freight traffic BARRIE owns and operates its own Electric Light Plant The price of light per 1000 Watts is 8 cents. After 8 day service for power purposes at low rates will be quoted to new clients.

BARRIE S population is 6 880.

BARRIE owns and operates its own Waterworks System which is managed by a Commission The supply from Artesian wells is inexhaustible and in absolutely pure in fact the purest on the Continent being 6 per cent above par by analysis The capacity per day of six hours is 2 000 000 gallons the present 80 to domestic pressure 80 lbs. The price for supply per flat rate is $8 00 per annum The price for 1000 gals by meter is 22 cents domestic.

BARRIE has 25 miles of cement sidewalks and splendid roads

BARRIE has 5 Banks, 0 Hotels, Loan and Loan Insurance Companies 4 Printing and Newspaper Offices, 2 Churches, Armouries Theatre Public Library Y M C. A Gas Plant and a 52-roomed Hospital

BARRIE has an excellent sewerage system and is a very healthy town to live in Hay fever a entire y unknown

BARRIE is beautifully situated and has natural scenery in abundance in the shape of mountain, and shore scenery The Venice of America. Kempenfelt Bay affords good boating, fishing and bathing

BARRIE is the home of the Barrie Tannery Barrie Carriage Works Canada Produce and Gas Engine Co Barrie Planing Mill The Ball Plan ng Mill Co. and other industries.

BARRIE has many advantages for manufacturers of Woodenware, Knitting Mills, Tannery, Shoe Factories, Wood Factories etc. and has a number of these and factory sites a very low figure

BARRIE has a navy of harbour both sailing and steam

BARRIE is surrounded by a magnificent farming country and has a good market for live stock produce grain, etc

BARRIE'S boat service connecting with Orillia and other towns and resorts on Lake Simcoe, is good and improving yearly and is greatly appreciated by summer tourists It has within an hour's run of Barrie the shore front suitable for summer cottages and summer resi dences.

BARRIE Citizens Band is a first-class organization and gives free concerts weekly throughout the summer months.

ORGANIZATIONS AND SOCIETIES.—Barrie Bowling and Tennis Club Barrie Hunt Club Rod and Gun Improvement Society Barrie Aquatic Club

BARRIE SPORTS.—Swimming, Boating Fishing Bowling, Tennis Golf Ball Lacrosse, Driving, Motoring, &c

Fenelon Falls, Ontario

To the thousands of campers, tourists, owners of power yachts, from both Canada and the United States who annually spend their summer vacation on the beautiful chain of lakes between Balsam and Cameron Lakes, constituting the Trent Canal as summer resort is more favorably known than Fenelon Falls, Ont. This charmingly situated little town is practically the key to one of the most beautiful sections of the Kawartha Lakes. To the tourist who depends upon his canoe to guide and to convey himself and his summer outfit from point to point no more delightful summer and pleasure location could be selected. The everlasting roar of falling water soothes the senses of the man who in town or city has his nerves upset by the strenuous competition of modern life. The Fenelon River quickly flowing past the town which he may stop, with its pure-reserved banks where vegetation counts in daily course by arranging home cracks and niches in the massive grey rock, rooted with pepper bush. In the shadow of the granite flanks back mascinonge and black bass, only waiting for the spoon of the angler or the bait of the real fisherman. Within a few hundred feet of the admirably conditioned and well kept dock facilities of Fenelon Falls is one of the best fishing grounds. If water only be so deep bed to be found in our grand River near Fenelon Falls can boast of having some of the finest and best managed hotels in Ontario.

The drinking water of Fenelon Falls is except nearly pure and good. From Fenelon Falls the sewers of gasoline and steam launches run readily to all parts of the Trent Canal system. The summer visitor runs his magnificent boating, bathing and berthing within a few feet of his hotel. The public steamboat service is unsurpassed. Fenelon Falls is within easy reach of Lindsay, Peterboro and Toronto by rail.

Manufacturers seeking locations where cheap power and transportation are a universal factor should keep Fenelon Falls in mind. Extensive power is here to be had for $ 15.00 per horse-power. The Town Council and Board of Trade of Fenelon Falls both active and progressive municipal bodies offer desirable locating manufacturers, free building sites and exemption from taxation, should such locating factories employ a minimum number of hands. Full information along such lines will be fully, freely and cheerfully supplied on any matter by the Secretary of the Board of Trade Fenelon Falls Ont. Fenelon Falls is THE place to spend you summer vacation if you want Health. Have now Good Bathing, Good Boating and Good Bass Fishing.

Fenelon Falls

The Electric City—Peterborough

MOST interesting point on the Trent Waterway is the City of Peterborough with a population of 15 000. It is the only City on the Waterway and in one of the most prosperous, progressive and attractive places in the Dominion. The growth of the City especially in the last few years, has been rapid owing to the industries developed. Its low taxes, clear and as attractiveness and beauty has kept pace with its salubrious and numerous of population. The basis of the growth of Peterborough is the fact that it has a the essential and economical for manufacturing and distributing, and in this respect it has advantages that are not excelled anywhere. The essentials for a manufacturing centre are

Cheap electric power and plenty of it
Shipping facilities for receiving all materials
Suitable sites for industries
And good labor conditions.

Of Electric power there is not from the water powers on the Otonabee River and other waters, Peterborough has an abundant supply. Some of these power sites have been developed and others are being developed and as fast as it may be called for 30 000 horse power of hydro-electric power can be supplied. The abundant supply of power is furnished delivered to the use for power purposes in very low rates—as low as to be most attractive to manufacturers.

The shipping facilities are unexcelled. The City is located between the two commercial centres, Montreal and Toronto and is on the line from the Georgian Bay (which means the Northwest) to the seaboard and is in a central location for reaching all the best markets. It has both the Canadian Pacific and Grand Trunk Railways. The Grand Trunk branches on to four different directions from the City and besides being on the main line of the Canadian Pacific Railway between Montreal and Toronto, it is also on the Canadian Pacific Line to the Georgian Bay. It has thus direct connection with all parts of the Dominion. The Trent Water way also gives water communication as is described in this publication.

The number and diversity of the industries in Peterborough natural about of a high and desirable and about troubles are unknown. The workmen are happy and prosperous and interested in the welfare of the city. Owing to exceptional water power the manufacturing cost are exceptionally low.

Possessing these essentials for manufacturing and distributing, Peterborough also has excellent systems of sewers and waterworks electric street railway services to and from parks, pleasure resorts churches and public buildings, a number of well kept parks and schools. Collegiate Institute, and Provincial Normal School first-class institutes in manufacturing three banks, theatres, a few acres of asphalt pavements, fire protection—all the conveniences of modern, health comfort and pleasure.

The summer resorts adjacent to Peterborough are celebrated ones including Stony Lake, which is a picturesque in area Chemong Lake with its beautiful parks, and the Kawartha Lakes and Rice Lakes with their numerous an active resorts

These advantages of situation given by nature and the acquired advantages that have been secured and built up combined with the pull in spite of the names, have resulted in Peterborough growing in the other towns in the district in its rate for advancement. Its manufacturing industries are numerous and diversified. The Canadian General Electric Company is one in which about 3000 employees are engaged. The Quaker Oats Mills, The Brinton Carpet Factory whose carpet industry is England and woollen mills, both famous the world over, makers of mill, rolling and hydraulic brass and copper rods, ornamental locks and builders hardware business and steel are stoves, boats of a high build and water, rope and cordage gasoline engines, lumber brick, farm tools, canoe products, cream engines and bicycles show cases machinery pork products, and many other lines. A together there is $12 150 000 of capital invested in manufacturing in Peterborough and the annual product of its industries aggregates $42 000 000. Proposed enlargements are emphatic evidences of the prosperity of the industries. Wholesale houses of which there are several mostly in the city advantages as a of distributing centre.

The many superior advantages of Peterborough are open to new industries, and speculators will be well ready answered and information cheerfully given, and every effort will be made to facilitate their establishment. For and most label pence on any point on for specific information bearing on any line of manufacture write in the City Clerk and prompt attention will be given.

Trenton

BESIDES being the southern outlet of the Trent Canal, Trenton is conspicuous for its many natural advantages. For many years the solution of Trenton have looked forward to the development of the water power on the Trent River. In a small way the Trenton Electric and Water Company have for a number of years developed a limited quantity of power at the Town timber dam, while the Gilmour Power Company also developed sufficient power at the same dam for their own use.

During the last couple of years the Electric Power Company has secured the practical control of all the powers on the River Trent Hendry's Falls in Trenton, and is so situated that their total development will exceed 100,000 horse power. This Company, with an extensive transmission system, has covered the Central Ontario district thoroughly and has acquired many of the local lighting and power plants in the towns and villages between Oshawa and Belleville.

Last January an excellent Council was elected and as a result of their efforts and with the assistance of an energetic Board of Trade, Trenton has advanced more commercially during the year 1910. The Council and Board of Trade of 1911 will long be remembered as having obtained more materially in bringing Trenton's advantages before the people of Canada and the United States.

During the year has, of course, been the magnet which has attracted many of the new industries to Trenton. Power at $15.00 per H. P. twenty-four hours service, delivered at the customer's switchboard, is certainly a drawing card. The City of Trenton has at this rate 1600 H. P. to dispose of, having, in return for a lease of its power rights at Dams I and 2 to the Electric Power Company, accepted this amount of power as part of the settlement. The Trenton Electric and Water Company has now available for Trenton users, 10,000 horse power and upon the completion of Dam No. 3 will have to dispose of 20,000 H. P.

Of all the towns along the Canal, Trenton possesses the greatest development, because it has the added advantage of being on the shore of lake Ontario and, being situated midway between that any other town in Ontario. Trenton can offer great facilities for shipping by rail. It is the junction of the Grand Trunk and the Canada Central Railways. This latter road is part of the Canadian Northern Ontario System lately acquired and Canadian North Act. trains will be running through Trenton on July of this year. The Canadian Pacific takes there its new belting surveyed between Toronto and Montreal will run through Trenton. The proposed electric road between Toronto and Montreal will also traverse Trenton.

With many accept via the Murray Canal to Lake Ontario Trenton has superior advantages as a distributing point by water. The Picton and Consecon Ontario Navigation Company's Steamer Bellaire makes its regular trip twice each week when on its run between Toronto and Montreal, while the large and handsome steamer of the Canada & Quebec Navigation Company, namely Alexandria running between Rochester and Quebec, makes the same number of calls at Trenton. The Comox, the handsome new boat, now completed at Collingwood, will also ply on it's route. The steamers Victoria and Hawkesbury make daily trips between Trenton and Picton calling at the Lovalist and Deseronto. In addition to the passenger and freight boats has risen enormously by these boats, many large bulkheaters call at Trenton carrying chiefly coal cargoes.

In addition to being a manufacturing town of importance, Trenton is fast coming under the notice of the people of Canada as a summer centre. Where can you find a more beautiful spot for the summer campers and cottagers than the shores on its inlet the Trenton harbour? The land locked water affords a ways unsurpassed by any. The enchanted waters from the city do not suffer its surface. How many would accept the delightful breath of an Atlantic wave ing place if this idea sentiment were brought to his notice? In one instance the prominent which the United States displays in keeping her places before the public. If the other transportation companies who are especially interested in this matter would do as much to make the advantages known as the Ontario & Quebec Navigation Company has done many more would come here every year.

It is by advertising that in less than two years, will be possible for small boats to ascend the Canal as far as Washago on Lake Couchiching above Orillia. To accomplish this, with the beautiful scenery along the banks of the River Trent. In prospect of making it a trip to a numbered a motor boat will be now existing. Probably the latest back seat and shortest fish ing on Ontario is in the line in the waters of the Bay of Quinte and the River Trent.

Spared of every kind, having in view the physical development of the young men of the town, are freely indulged and encouraged by all. The boys and girls who grow up in Trenton will always look back to the days of the old school with fondest pleasure. No inland town for them

Participants

Electric Motive Power for Eastern and Central Ontario

THE most prominent feature associated with the opening up of the Trent Valley Canal and closely allied with its engineering purpose is apparent in the rocky rapid development of the abundant water powers of the basin which the Canal traverses for three-fourths of its length. Rising in the remotest parts of the Highlands of Ontario the Trent waters are collected by half a dozen important tributaries and poured turbulently into the original chain of Kawartha Lakes covering approximately an area of 26,000 acres, and whose mean elevation above Lake Ontario is 850 feet.

From this huge reservoir the water drops in a succession of falls varying from 10 to 70 feet in height and scattered uniformly along the river's course, to its outlet at Trenton.

From these water falls about 100,000 H.P. is being made available on water wheel shafts and 70,000 H.P. delivered for the industrial centres as electric energy.

The economical generation, control and distribution in points of thousand of this very large quantity of power by the various original individual proprietary interests was manifestly impossible. As a consequence the development of the situation evolved a single comprehensive system whose modern and standardized hydro-electric stations dot the map from Burleigh Falls to Trenton.

Channeling and radiating from the generating centres, a net work of carefully planned transmission lines covers the whole of Central Ontario from Peterborough at the north to Kingston on the east and Whitby on the west over which the power is distributed.

This argument as of power success is known as THE ELECTRIC POWER COMPANY, LIMITED with head offices in Toronto. Its power distribution system is almost complete and not only in every manufacturing centre in the Trent district benefiting by the cheap and abundant power but brought to its doors be there are few villages and rural centres which in part remain to-from electric light and modern electrical conveniences. This organization is furthermore giving the appreciation of electricity a native land power to its close study with a view of utilizing enlarging the scope of its market and making Canal of Ontario the most modern and well developed community be a industrially and agriculturally in Canada

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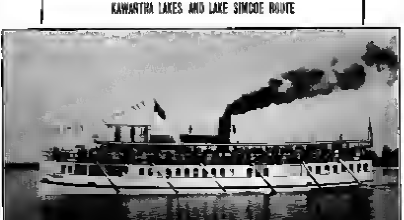

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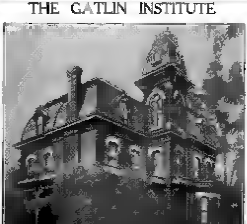

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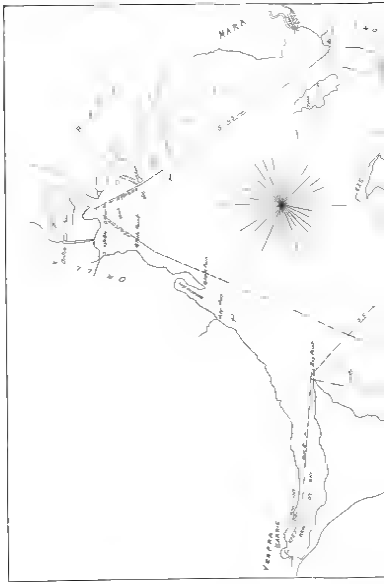

MARA

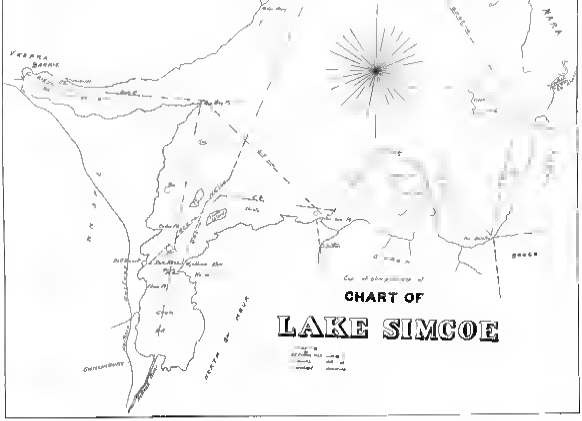
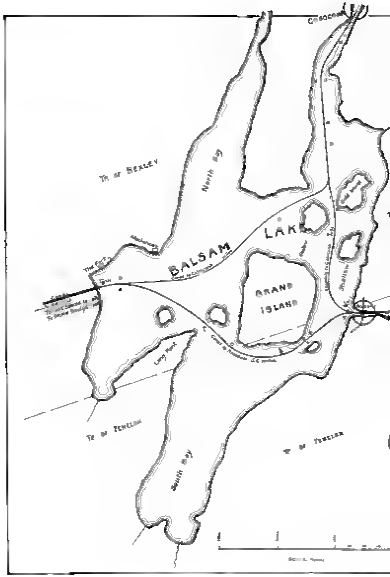
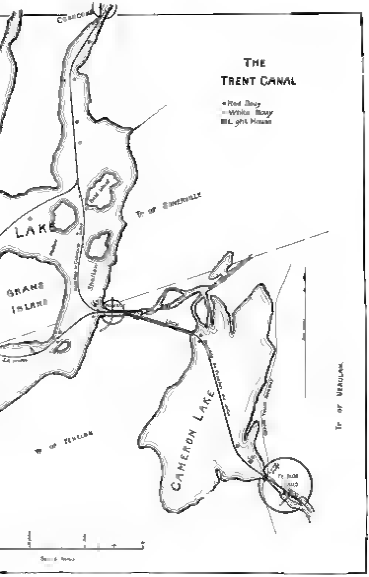
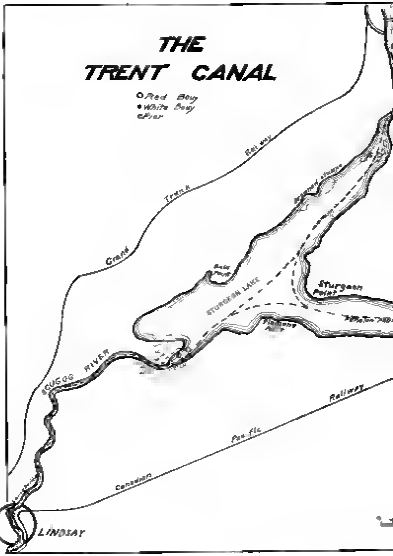


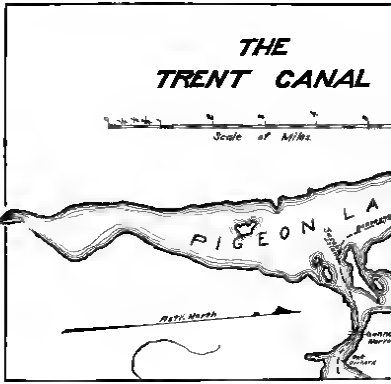
CHART OF
LAKE SIMCOE

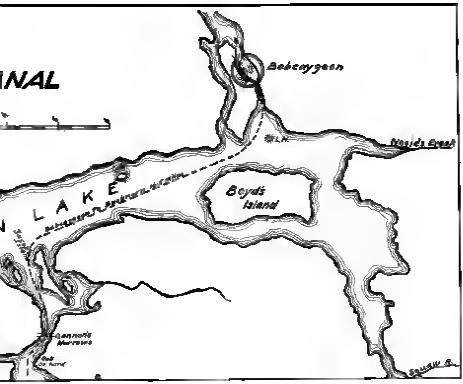

BALSAM
LAKE
GRAND
ISLAND
Th. of Stanley
Th. of Ferguson
Th. of Thurlow
North Bay
South Bay
Long Point
Gibraltar Point
Crandell


THE
TRENT CANAL
Red Buoy
White Buoy
Light House
LAKE
GRAND
ISLAND
TP OF SMITHVILLE
TP OF VERULAM
TP OF VERULAM
CAMERON LAKE

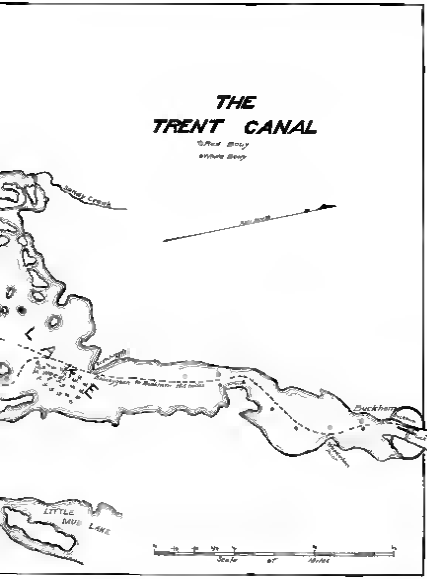

THE
TRENT CANAL
Trent
Grand
Sturgeon Point
STURGEON LAKE
Pan Pt.
Railway
Canadian
LINDSAY

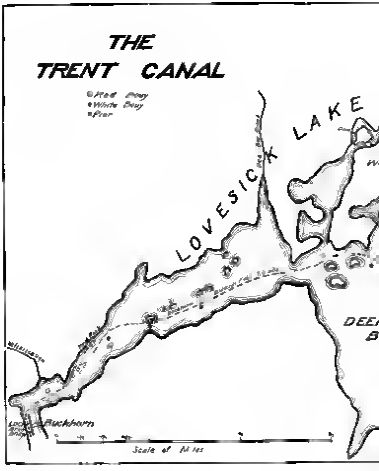
Fenelon
Falls
Red River
Scale of Miles


THE
TRENT CANAL
Scale of Miles
PIGEON LA
Reid Marsh

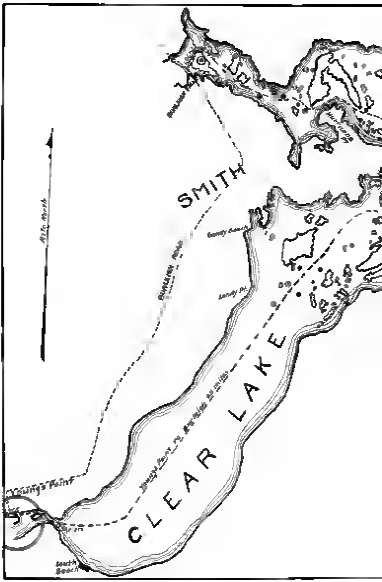

NAL
Bobcaygeon
Boyds Island

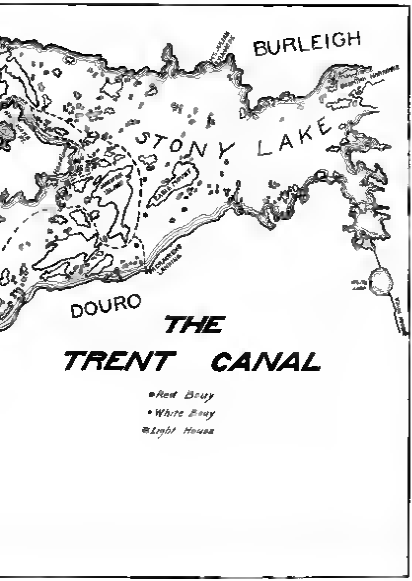
BUCKHORN
CHEMONG LAKE

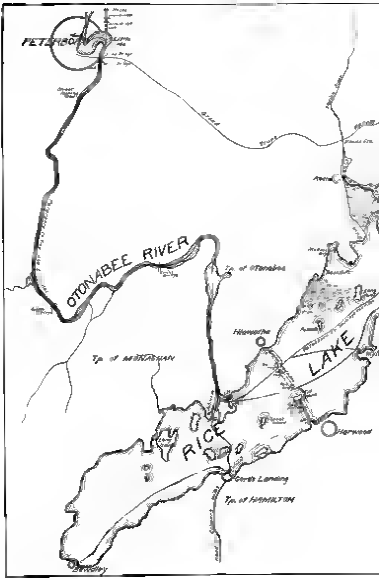

THE
TRENT CANAL
Red Buoy
White Buoy
Indian Creek
L A K E
Duckhorn
LITTLE MUD LAKE
Scale of Miles


THE
TRENT CANAL
Red Buoy
White Buoy
Pier
LOVESICK LAKE
DEE
B
Buckhorn
Scale of Miles

LAKE
Wolf Island
DEER
BAY


SMITH
CLEAR LAKE


BURLEIGH
STONY LAKE
DOURO
THE
TRENT CANAL
•Red Buoy
•White Buoy
⊛Light House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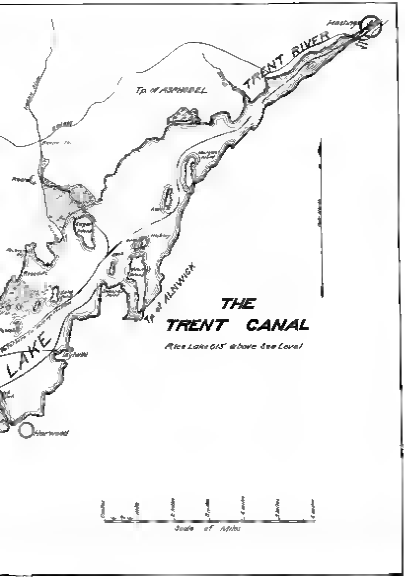
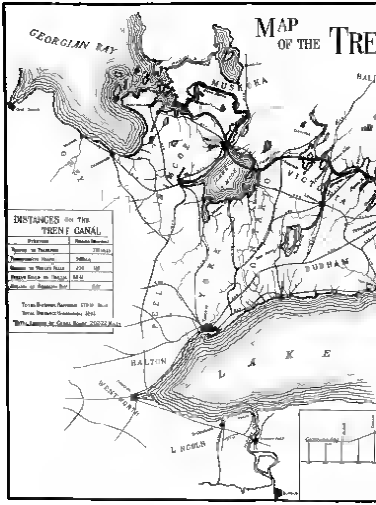
OTONABEE RIVER
Twp. of Otonabee
Twp. of MORNINGTON
Hillsdale
LAKE
RICE
North Landing
Twp. of HAMILTON
Cavanagh


TRENT RIVER
Twp. of ASPHODEL
at KENNISIS
THE
TRENT CANAL
Rice Lake 615' above Sea Level
LAKE
Scale of Miles


MAP OF THE TRE
GEORGIAN BAY
MUSKOKA
DISTANCES ON THE TRENT CANAL
PETERBORO
TRENTON
PEMBROKE
BURNT RIVER
BOBCAYGEON
PORT HOPE
COBOURG
PORT DARLING
PORT HOPE
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HALTON
L A K E
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Scale

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SCALE 8 MILES to 1 INCH

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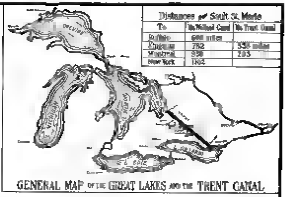
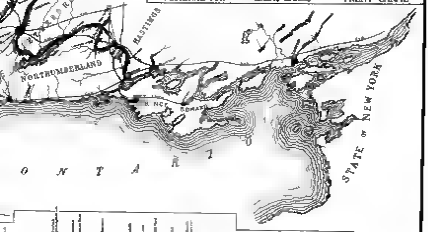

Distances per Sault St. Marie
To | By Welland Canal | By Trent Canal
Kingston | 1000 miles | —
Toronto | 750 | 525 miles
Montreal | 930 | 705
New York | 1065 | —
GREAT BRITAIN
LAKE ERIE
LAKE ONTARIO

GENERAL MAP OF THE GREAT LAKES AND THE TRENT CANAL



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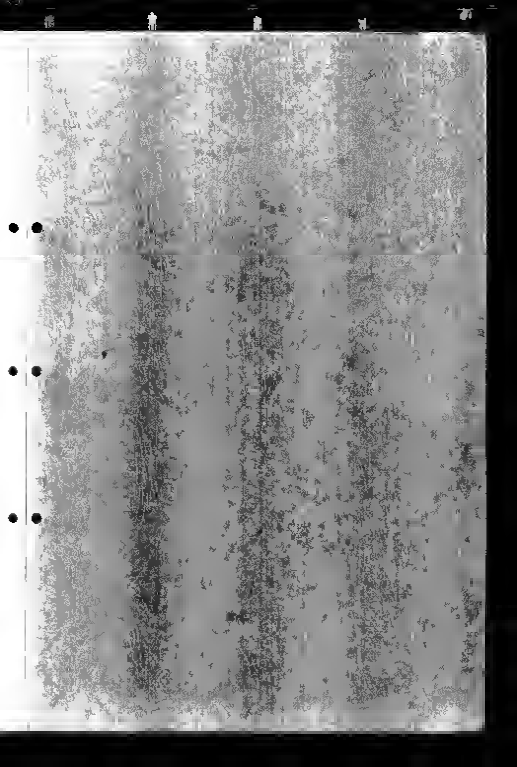

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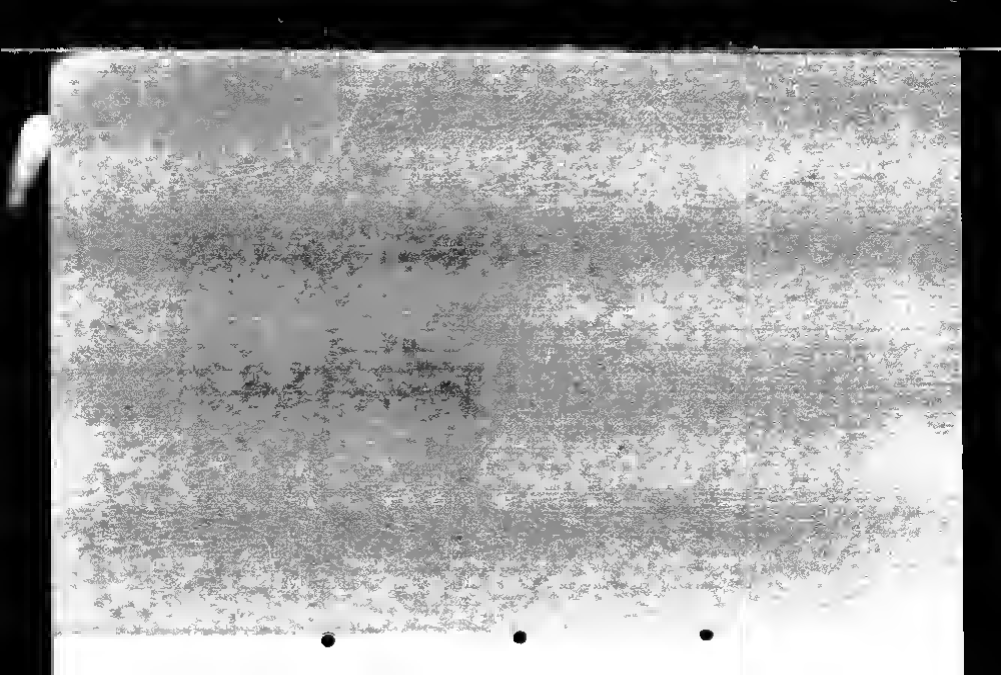

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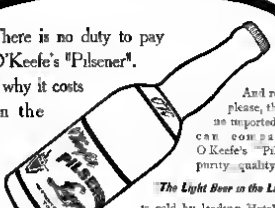

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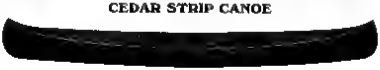

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INTRODUCTION

DURING the past few years there have been a great many requests for detailed information regarding the Trent Canal. This has especially been the case since the completion of what is known as the Lake Simcoe-Balsam Lake Division throwing open as it did an uninterrupted stretch of navigation of 160 miles extending from Orillia on Lake Simcoe to Healey Falls on the Trent River. The increasing popularity of the various lakes and rivers that constitute the Trent Canal as tourist and summer residence centres has added greatly to the number of private yachts, steamboat business has increased to large proportions and we now have practically a through steamboat service from the Trent River to points on Lake Simcoe. With this increase in the number of yachts and steamboats has come an increased demand for charts of the navigable channel and for information regarding the Canal generally. It is therefore, with a view of satisfying the desire for enlarged knowledge in these respects that this book is compiled. I have endeavoured in present herein in as complete and condensed a manner as circumstances will permit charts of the various lakes which will prove useful to navigators, facts concerning the early history of the Canal and more or less comprehensive details generally concerning the position the Canal occupies at the present time and is destined to occupy in the scheme of Canadian transportation.

I regret that at the time of the publication of this work no official charts were available in the Railways and Canals Department defining the navigation channels of the greater portion of the lakes and rivers that constitute the Trent Canal. The charts presented herein while unofficial are for the most part based upon the observation and experience of practical navigators and will be found sufficiently reliable to permit of navigation with reasonable care and safety the 160 miles of Canal and connecting waters between Orillia and Healey Falls. The chart of Lake Simcoe however which is herein published is absolutely authentic and should be found invaluable to vessel owners on Lake Simcoe.

E. S. CLARRY

MADE THE FIRST TRIP

THAT the route of the Trent Canal via the Severn and Trent Rivers was a recognized channel of water communication between Lake Huron and Lake Ontario by the Indian tribes of centuries ago is a well known fact. The Huron Indians who resided along the shores of Lake Huron and Lake Simcoe were undoubtedly familiar with this comparatively short water route to the Bay of Quinte. After paddling across Lake Simcoe and up the Talbot River for some little distance they portaged across to Balsam Lake, the summit waters between Georgian Bay and Lake Ontario. Hence we to day have running across from Lake Simcoe to Balsam Lake what is known as the "Portage Road." It follows the same trail that was used by the Indian tribes of several hundred years ago.

Champlain, the French explorer, was the first white man to come down from Lake Huron to Lake Ontario by way of what was to be known nearly three hundred years later as the Trent Canal. This was in the year 1615. The story of Champlain's trip over these waters as told by Francis Parkman in his history "Pioneers of France in the New World" is most interesting. Champlain had gone up the Ottawa River and portaging west to Lake Nipissing came down the French River into Lake Huron. His expedition down through the Lakes and Rivers that now constitute the Trent Canal, is best told in the historian's own words:

"At the outlet of Lake Simcoe they all stopped to fish;—their simple subsistence by a commissariat. Hence, too, the intrepid Etienne Brulé, at his own request was sent with twelve Indians to hasten forward the five hundred allied warriors—a dangerous venture, since his course must lie through the borders of the Iroquois.

"He set out on the eighth of September, and on the morning of the tenth, Champlain shivering in his blanket, awoke to see the meadows sparkling with an early frost, soon to vanish under the bright autumnal sun. The Huron fleet pursued its course along Lake Simcoe, across the portage to Balsam or Sturgeon Lake, and down the chain of lakes which form the sources of the river Trent. As the long line of canoes moved on, its way no human life was seen; no sign of hostile foe, yet at times to the fancy of Champlain the borders of the stream seemed decked with groves and shrubbery by the hands of man, and the walnut trees laced with grape-vines seemed decorations of a pleasure ground.

"They stopped and encamped for a deer-hunt. Five hundred Indians in line, like the skirmishers of an army advancing to battle, drove the game to the end of a woody point, and the canoe-men killed them with spears and arrows as they took to the river. Champlain and his men keenly relished the sport, but paid a heavy price for their pleasure. A Frenchman firing at a buck brought down an Indian—and there was need of liberal gifts to console the sufferer and his friends.

"The canoes now issued from the mouth of the Trent. Like a flock of venturous wild fowl they put boldly out upon Lake Ontario, crossed it in safety, and landed within the borders of New York, on or near the point of land west of Hungry Bay."

The First Survey

It is just 78 years ago since the first survey was made of the proposed route of the Trent Canal. Twenty four years later the project was discussed at considerable length in Canadian Pamphlets and a review of the efforts of the people of the Trent District to have the scheme carried to a successful issue is an interesting to-day as it no doubt was at that time. In reading the extracts herein taken from Canadian Pamphlets it will be observed that the Georgian Bay Ottawa River Canal scheme was a live issue of that time—just as it is to-day—but it looks certain that in the matter of construction the Trent Canal although a great many years on the way will nearly vessels from Georgian Bay to Montreal before the larger scheme of the Ottawa River route is more than actually commenced. Canadian Pamphlets a publication of 1857 says: In the year 1833 the project of connecting the waters of Lake Simcoe with those of Ontario by means of a Canal passing through Rice Lake and the Bay of Quinte was generally discussed and received the attention of the Government. Mr. N. H. Baird Civil Engineer was appointed by His Excellency Sir John Colborne to make a survey of the waters connecting those two Lakes with a view of fixing upon the practibility of the route for that purpose. He entered upon the work in 1833 and in that year completed the survey of the Trent and Otonabee Rivers. Having received further instructions he resumed the survey in 1835 and continued it from Peterborough via the Otonabee and back waters to Lake Simcoe. This report of his surveys was exceedingly favourable. The estimates for the works made the latter proposed com of opening up an uninterrupted water communication between the Bay of Quinte and Lake Simcoe a distance of about 105 miles and 706—4 feet of lockage £495 515.

Mr. Baird however appears to have feared that the amount of the estimate might deter the Government from prosecuting the work to which he attached very considerable importance. He therefore made the suggestion that only the least expensive sections of the Canal should be at once proceeded with and the other portions Reserved for which says the report "it is rather remarkable the whole ground of these intermediate sections afford the most favourable opportunity for construction that can be imagined or wished for any distance that is being in the proper direction and may of construction. The estimate of the probable expense of forming a connection between Lake Simcoe and the Bay of Quinte on the double principle of railway and canal was £185 565.

The objection of transhipment an almost insuperable one in the double scheme Mr. Baird proposed to get rid of thus. With the view of doing away with the only at least the most objection to the requisite system—the idea of frequent transhipment—I would propose that long and substantial steamers of particular construction should regularly ply to and from on the Intermediate water communication and so arranged as to admit of the transfer cars being transported at once with their loads rigs direct either for Lake Huron or Lake Simcoe, as the case may be and which I am satisfied can be done in such a way as to be practically useful and serve well the present and until such time as it may be deemed proper to put the lockage system in execution the prospective wants of the country.

This project great as was the interest which attached to it at the time was never carried out. Some £90 000 odd was expended upon the River Trent work and the lock at Peterborough basin proposed by Mr. Baird was constructed but the troubles of 1837 38 and the changes which immediately succeeded prevented the full execution of the project of connecting the waters of Lake Simcoe with the Bay of Quinte. The necessity for such a work however has never been lost sight of. With in the last two or three years the project of connecting the waters of Huron with those of Ontario or the St. Lawrence, with a view of directing the immense and growing trade of the Western States through Canadian channels—its natural outlet—has engaged the attention of the people and press not only of Canada but of

Sun

Chicago and the Western States. Two projects to that end are before the public: the one to connect the Georgian Bay with the City of Toronto; preliminary surveys of which have already been made, arresting it to be a work of great though by no means insuperable difficulties; and the other to connect Lake Huron with the Ottawa. A project to which Mr. Walter Shanley, one of our ablest Provincial Engineers, has given his adherence. But it is quite evident that neither of these schemes, important as they unquestionably are, can for a single moment compare with that projected in 1833, a whisk reference has been made. The first in addition to the immense expense of the work, $25 000 000 00, owing to the heavy carriage that require to be made, and the great engineering difficulties that must be surmounted, offers but problematical advantages as a national work. That it would prove of very great advantage to the City of Toronto, and divert much of the western trade through that city is undoubted; but when that has been said, the main argument has been advanced that can be advanced in its favour. It opens up no new country, and the product once in Ontario through Toronto stands equal chance of finding its way to the Atlantic through American as through Canadian channels. The second proposal, that of connecting the waters of Lake Huron with those of the Ottawa, stands deservedly high as a national enterprise. If constructed it would open up an immense section of country now absolutely useless, and it would have the effect of placing Canadian shipping before any other for the conveyance of the produce of the west to the markets of Europe, advantages which cannot be overlooked in the construction of a national work. But the heavy outlay required on such a work is likely to retard its completion for many years. The route *via* Peterborough and the Trent with its offering advantages almost equal to those of the Ottawa Canal, as regards the opening up of the country, and the development of trade by the St. Lawrence is so much less expensive as to offer much greater prospect of immediate construction. The advantages of this Trent route were thus represented in a letter recently addressed by W. S. Cowan, Esquire to the Chief Commissioner of Public Works.

First.—It is shorter and more direct than any other, except the Toronto and Georgian Bay which from its great cost, may be set down as impracticable from Chicago and the Sault Ste. Marie to the seaboard, whether *via* Montreal and Quebec or Portland or New York.

Secondly.—It passes through a rich and fertile country, and presents fewer engineering difficulties, and could therefore be constructed for a much smaller amount, than either of the other proposed routes.

Thirdly.—Being at least two degrees further south than the Ottawa route it would have the advantage of being open for two or three weeks longer every season.

Fourthly.—Its terminal harbours would be large and commodious—particularly that at the mouth of the Trent—having on one side the Bay of Quinte, and on the other by a short and somewhat circuitous cut, the Presque Isle Bay; the safest and most commodious harbour on Lake Ontario, thus affording an easy and safe entrance to Trenton from Lake Ontario and the River St. Lawrence.

The advantages of the Trent River in point of distance may be estimated by the following figures:

From Chicago to New York, *via* Buffalo and Erie Canal	1 018 miles
From Chicago to New York, *via* Welland Canal and Oswego	1 038 "
From Chicago to New York, *via* Huron, Nipissing, Ottawa & Caughnawega Canal	1 358 "
From Chicago to New York, *via* Georgian Bay, Valley of the Trent and Oswego	1 232 "
From Chicago to Montreal, *via* Lake Nipissing	1 005 "
From Chicago to Montreal, *via* Georgian Bay and Valley of the Trent	1 003 "

It will thus be seen that in point of distance to New York, the Trent route has the advantage over the Nipissing and the Ottawa route by 126 miles. While between Chicago and Montreal the distance is in favour of the Ottawa route 28 miles; an advantage however more than overbalanced by the intricate and difficult navigation of the latter.

But the pages of a work like this are hardly the place wherein to discuss this subject and the reader is therefore requested to regard the remarks relative to the merits of the different Canal schemes now before the public as parenthetical in their character.

Such was the position of the various Lake Huron-Lake Ontario canal schemes as viewed by Canadian Pamphleteers in the year 1857.

Seen

Started By Imperial Government

As has already been stated the locks just below the City of Peterborough and the locks at Hastings on the Trent River were built in the year 1837 at Thumbnails The construction of these two locks was the first step in a practical effort to connect Georgian Bay and Lake Ontario by means of this route and they were built by the Imperial Government As a matter of fact a lock was also built at about the same time at Glen Ross better known perhaps to many as Chisholm s Rapids was selected as one of the most important points to hand one of the first locks on the system few we venture to say can even imagine as it did not afford any local benefit nor did it throw open any substantial additional stretch of nav gation Its gates never opened to greet a friendly vessel its grey limestone walls never re-echoed to the sound of the steamer s whistle and for 70 years or more it stood as a monument to the enterprise of the Imperial Government The lock at Chisholm s was demolished only a year or two ago to make room for the substantial and modern concrete lock which is already completed and which is one of the 18 locks now being built on the Ontario-Rice Lake section of the Canal The lock at Hastings which afforded a means of navigation from Healey's Falls to Peterborough a distance of 53 miles remained in commission until only a few years ago when it was closed and demolished to be replaced by a more modern and much larger one The lock at Peterborough has been deepened since its original construction but its walls are about the same as they were when first built

Other locks had been built at several points, but their construction was more with a view to meeting the requirements of local interests, rather than with a view to a scheme of through navigation In fact as far back as the year 1835 a lock was built by the "Inland Water Commissioners" at Bobcaygeon which afforded a means of navigation from Sturgeon Lake to Pigeon Buckhorn and Chemong Lakes In the year 1837 the construction of a lock was commenced at Lindsay on the Scugog River and it was placed in commission in the year 1843 It opened a stretch of navigation to Port Perry and other points on Lake Scugog In 1846 a wooden lock was built at Rosedale, connecting Balsam and Cameron Lakes and about the same date the building of the present lock at Young s Point was undertaken When completed a few years later it afforded navigation for vessels between Lakefield and Burleigh Falls and other points on Stony Lake

However the idea of connecting Lake Huron and Lake Ontario by means of a canal through the Trent Valley was by no means dead The interest taken in the project by Sir John Colborne Lieutenant Governor and afterwards Governor General had induced many settlers from the Old Country to establish themselves on those waters, and the subject came up for discussion and renewed interest at intervals About 1858 Mr W S Conger M P for Peterborough called attention anew to it a great route for transportation and subsequently advocated its construction by appeals to the Government and by speaking constantly of its merits in the House and in the press Nothing was done at the moment but in 1867 at the time of Confederation the British North America Act reserved the works on these waters and their control for the Dominion of Canada contemplating the completion of the project

Soon after 1870 Mr Mossom Boyd of Bobcaygeon took up the matter accumulated much information and by his energetic advocacy stimulated renewed discussion in the press He obtained a charter for its construction as a private enterprise, and even proceeded to London to secure the interest of capitalists but circumstances at that time were not propitious, and he was not successful in his efforts

In 1878 the question was again brought up in a new light The Ontario Government obtained from the Mackenzie Administration a transfer to them of the works on the Trent and this was strongly opposed in the local press as giving up property unjustly reserved

at Confederation and virtually abandoning the idea of ever opening the Trent Waterway for transportation. The opposition leaders supported this view and when that autumn they succeeded to power they rescinded the order in council making the transfer. In the years 1878 to 1881 considerable survey work was done with a view to proceeding with the construction of the Canal. Mr. David Stanton, C.E. and Mr. Tom S. Rubidge had been in that annual engaged in the work. Mr. Thos. D. Balkam became Superintending Engineer.

The agitation by the people of the Trent Valley district broke out pretty strongly about the year 1880 and by the year 1883 contracts were let by the Dominion Government for the construction of the locks at Fenelon Falls, Bobcaygeon, Lovesick and Burleigh Falls. About 1887 these sections were thrown open for navigation completing an unbroken stretch of navigation from Balsam Lake to Lakefield. About the same time the demand for the completion of the Canal became stronger and more emphatic than ever. Trent Canal Associations were organized, deputations representing the entire district from Midland to Trenton visited Ottawa, red hot newspaper editorials were handed out, and oratory with a vengeance and a Canal flavor was to be heard at public meetings.

Mr. Thomas Rubidge, one of the Government Engineers in charge of the work, was accused of being lukewarm on the project and a glance at the report and estimate made by him on the proposed work would certainly go to show that he was not bubbling over with enthusiasm for the completion of the Canal. The Government of John A. Macdonald finally decided to appoint a commission to enquire into the merits of the proposition. This announcement was not very enthusiastically received by the friends of the project who felt that the feasibility of the scheme as well as its necessity had been long ago established. However the commission was appointed in 1887. It was composed of Messrs. Judge Weller, Peterborough, John Kennedy, C.E. Montreal, and Frank Turner, C.E. Toronto. They were to consider the question of further extending the line of water communication between Lake Huron and Lake Ontario, and to determine whether it is advisable that an extension of the main work should be undertaken, and if so, to what extent, and under date of December 17th, 1890, these Commissioners after personally going over the route, taking evidence at various points including Kingston, Montreal, Albany and Buffalo, reported:

"In considering the bearing of the Canal upon the development of the trade and natural resources of the country through which it will pass, it should be noted that the conditions are peculiar inasmuch as it would not be a connecting link in a chain of lakes and streams, which for the most part lie transversely to the line of the Canal, and that it would therefore afford access to an extent of country and coast line much greater than usual in a Canal of its length.

"The Commissioners upon the evidence and information which they have been able to obtain, and which accompany this report, are of opinion that an extension of the main work should be undertaken by the completion as soon as convenient and practicable of the work necessary to give continuous navigation from Balsam Lake to the Bay of Quinte. This would embrace the sections between Lakefield and Peterborough, and between Healey Falls and Trenton. In the opinion of the Commissioners a waterway would thereby be made which would not only increase the value of the works already constructed, but would assist and develop the industries along its route, and open up the resources of the country through which it would pass to such an extent as to amply compensate for the expenditure necessary to be incurred, although the work itself would not be expected to produce direct revenue.

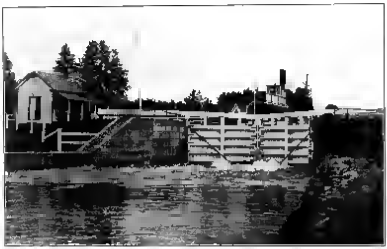
"This conclusion is arrived at by a careful consideration of the evidence adduced before the Commission by which the Commissioners feel they must be guided, such evidence to them minds greatly preponderating in favor of the extension of this important work in the manner indicated."

Although the Commission reported favorably to the completion of the Trent Canal in December, 1890, and although strong pressure was brought to bear upon the Government of the day to have new sections undertaken, it was not until 1896 that any move was made in the

matter. Contracts were, in that year, let for the construction of the division extending from Lake Simcoe to Balsam Lake, and for the Peterborough-Lakefield section. One of the contracts on the Peterborough-Lakefield section included the construction of the Peterborough Lift Lock, while the Kirkfield hydraulic lift lock was included in one of the contracts of the Lake Simcoe-Balsam Lake Division. The Peterborough Hydraulic Lift Lock was opened in June 1904, and the Kirkfield Hydraulic Lift Lock in July 1907, thereby throwing open a stretch of navigation 160 miles in length, from Orillia to Healey's Falls.

The Peterborough-Lakefield Division and the Balsam Lake-Lake Simcoe Division, were built under the supervision of Mr. R. B. Rogers, M. Can. Soc. C. E., who, from 1886 to 1907 was Superintending Engineer of the Trent Canal. When it was first suggested that hydraulic lift locks should be built on the Trent Canal, Mr. Rogers was instructed by the Department to proceed to Europe with a view of studying the matter of lift locks and their uses and report to this Department the result of his investigations. Mr. Rogers made the trip, gave the subject thorough investigation, acquired a large fund of information, having inspected three European locks in operation, and reported favorably to the feasibility of hydraulic lift locks on the Trent Canal. Mr. Rogers was in charge for the Government of the construction of both hydraulic lift locks.

In the year 1907 the Government decided to finish the southern outlet of the Canal. Accordingly, in August of that year, the first contract on the Ontario-Rice Lake Division was let. The work on this Division is dealt with elsewhere.



VIEW OF LOCKS YOUNG'S POINT

ENTRANCE TO LOCK NO 6 X PETERBORO H THE CA

A Toronto View in 1887

It has been mentioned elsewhere that the Trent Canal scheme has at times received very little support from a certain section of the Canadian press. The friends of the Trent Canal declare this to be especially true regarding the press of the City of Toronto. It must however be noted in all fairness to the press of the province generally that a most friendly interest has been displayed in the project during the past few years. That at least one Toronto daily paper had little faith in the scheme as a means of through navigation as late as the year 1887 may be seen from the following editorial from the Toronto Mail of October 11th of that year.

The announcement that a commission has been appointed by the Dominion Government to enquire into the advisability of proceeding with the construction of the Trent Valley Canal suggests the fact that that great public undertaking has enjoyed on paper an extended and somewhat chequered career. The Canal was projected in the year 1827. It is therefore, what sixty one years of discussion regarding it. In it has been talked about at every election—that the authorities have concluded that they are not quite sure the public requirements demand it. Delay however may not be fatal to this enterprise. Canal projects die hard as witness the struggles of the Huron and Ontario Canal. Moreover they have a habit of reviving just when it is supposed their last hour has come. The Murray Canal for example, was proposed in the year 1797. Interest in it waned and waned until 1880 or thereabouts, when, though everybody supposed the enterprise had collapsed a contract was suddenly let for its construction. It was proceeded with much to the political advantage of the Government of the day and is now an accomplished fact.

The original Trent Valley Canal proposition was not so extensive a scheme as that of to-day. The idea of its projector was merely to furnish a route by water from Lake Ontario to Lake Simcoe. The region in the neighborhood of Lake Simcoe was the Northwest of that period and people were anxious to open it up for settlement and for trade. It was not until 1833 that the Canal was reported on by an Engineer and it was then declared that two million dollars would complete it. It was at once resolved to proceed, but the work did not commence until 1837. For two years operations proceeded vigorously. In 1839 however, there was a stringency in the money market during which the cash borrowed for the Canal was devoted to other projects and as a result the contractors abandoned the work. In 1841 an attempt was made to revive interest in the scheme and to so urge it as that it might provide a through system of navigation from Lake Ontario to the Georgian Bay. But the Board of Works reported that as a through line the Canal would not be successful owing to the great leakage required and the limited draft of water of vessels which could be used on the route—and that for purposes of local traffic it would not be a success, because the route through its greater part, was extremely circuitous. The estimated cost of the Canal was placed at $3 600 000 00 and it was suggested that instead of resorting so large an outlay the works already undertaken should be completed and used as timber slides. This plan was adopted and the cost of the work up to the year of Confederation was $670 078 00. From Confederation on it has been impossible to convince successive Governments that a through Trent Canal is practicable. The first Conservative Government took little stock in the project and the Mackenzie Government after an effort to take over and complete the works had failed passed the whole affair locks, dams and slides over to the Ontario Government. The transfer having been accomplished just two days before the Reform Government went out. It was claimed that the object was to destroy the dams, rescue several thousands of acres of land which had been submerged for years and in fulfilment of a campaign promise, distribute them through the Ontario authorities among certain favourites of the various constituencies along the route. This accusation was stoutly denied and it was stated very plausibly that the works were

passed over to Ontario because they were merely timber slides and because the Government had resolved not to complete them with a view to the establishment of a through system of navigation

In 1879 the Dominion re-assumed the works and it has them still The authorities have from time to time expressed opinions and adopted measures which have led the residents of the Trent Valley district to believe that the Government seriously intends to build the Canal In the 1882 election this belief helped the Conservatives in Central Ontario counties but in 1887 it was less potent not because the Conservatives had altered their plans but because the Reform candidates professed to be as anxious as any person could be that despite the expense the Canal should be built In future contests the politicians in the district through which the *projected* work will run will no doubt vie with each other in their pledges of devotion to the interests of the Canal The result will be that the work will be found upon the party leaders, although it is almost a certainty that none of them approve of it

JUG LEE POINT AT THE MOUTH OF THE OTONABEE RIVER

AT THE MOUTH OF EEL'S CREEK STONEY LAKE

The Present State of Canal

AT the date of the publication of this work the extent of the finished portion of the Trent Canal is 165 miles, the distance from Washago (at its junction above Orillia to Healey's Falls, now available for navigation by vessels of 6½ feet draft. There is, however, in addition to this, a considerable extent of inland navigation for the draft mentioned by which side trips might be taken such as to the picturesque town of Barrie on Kempenfelt Bay on the western side of Lake Simcoe; to Jackson's Point on the south shore of Lake Simcoe, or to Lindsay on the Scugog River, continuing further down the stream to Port Perry on Scugog Lake.

After more than seventy years of a chequered career, all new locks as of the Trent Canal as a means of through transportation from Georgian Bay to Lake Ontario will be an accomplished fact within the next four or five years. At the present time the entire division from Healey's Falls to Trenton is under contract, and the work is being advanced with vigour by the various contractors. The fact that the Dominion Government has this year set aside the sum of $1,750,000 for construction work on this division, shows that the emergency policy decided upon, with respect to the early completion of the Canal, will be carried out with the least possible delay. As a matter of fact, it is regarded as extremely probable that several of the above mentioned contracts (there are seven in all) will be finished by the end of the present year. The contract for the section of Canal in the vicinity of Campbellford, which has been awarded to Messrs. Heney, Quarlan & Robertson, is the heaviest undertaking on this division, and it may be two or even three years yet, before it is completed, and before boats may be able to travel from the land-locked waters of Lake Simcoe to the broad expanse of Lake Ontario.

It should be mentioned also that the locks now under construction on the division extending from Trenton to Healey's Falls, and in fact extending up to Peterborough, are being built so as to provide for an 8 ft. 4 inch draft. This will accommodate barges of 1,000 tons. It is intended that ultimately the entire Canal will be deepened to accommodate vessels drawing 8 ft. 4 inches of water, with a minimum depth of nine feet between the locks.

However, even with the completion of the work at present under contract between Healey's Falls and Trenton, through navigation will not be afforded from Georgian Bay to Lake Ontario. There is yet to be placed under contract the section extending from Lake Simcoe to Georgian Bay, a distance via the Severn River of 30 miles. The work on this section of the Canal is not considered very heavy, consisting of the building of five or six locks and dams. The advocates of the early completion of the Trent Canal are hopeful that the Government may place this section under contract within the next twelve months, so that it may be finished concurrently with the Healey Falls-Trenton Division (officially known as the Ontario-Rice Lake Division) thereby completing within the next few years a Canal that will afford a water route from Sault Ste. Marie to Montreal shorter by 250 miles than that by the Welland Canal.

The Ontario-Rice Lake Division

IN the annual report of the Department of Railways and Canals for the year ending March 31st 1910 being the latest annual report of the Department to hand is found some very interesting information concerning the nature of the work that is now in progress in making the River Trent navigable for vessels of 8 feet 6 inches draft thus completing the southern outlet of the Canal Mr A J Grant Superintending Engineer who is in charge of the work says

This division embraces the fifty six and a half miles of all river route between Trenton on Lake Ontario and Rice Lake which will comprise when completed nine and a half miles of canal thirteen miles of submarine channel and thirty four miles of deep river whose average width will be about 500 feet The rise between extreme low water level at Lake Ontario and normal navigation level of Rice Lake is 36 8 feet which rise will be overcome by 18 locks ranging from 9 to 27 feet in height Fourteen concrete dams with stop-log sluices, will be required for the regulation of the river and at them 75 000 h p gross may reasonably be developed at the low water stage of the river but this quantity may be increased somewhat by a larger expenditure in tail race excavation The normal navigation level of the natural reaches of the river and Rice Lake will be that of ordinary summer level so that practically no damage will be done by flooding the land along the river and lake shores In the rapids the dams will hold the river at as high a level as practical which in the majority of cases, will be lower than the top of the river banks The canals and channels with sides showing above water will have a minimum bottom width of 60 feet except in two cases of short canals above locks where the bottom width will be only 50 feet and the submerged channels will have a minimum bottom width of 100 feet which will be marked at frequent intervals by small piers The canals and submarine channels will have a depth of 9 feet

There will be sixteen bridges, ten of which will be for highways and six for railways They will all be swing or bascule spans except that for the main line of the Grand Trunk Railway at Trenton Junction which will be a high level fixed bridge under which there will be a clear head room of 27 feet at a stage of high water in Lake Ontario

The locks will be of concrete and will have 8 feet 4 inches of water on the sills with chambers 33 feet wide by 175 feet long between hollow quoins They will accommodate barges of 1 000 tons whose size will be about 150 feet long by 30 feet beam and drawing 8 feet of water Entrance piers of not less than 150 feet in length will be provided above and below each lock The locks will be filled through culverts 4 feet wide by 8 feet high in the side walls which will be equipped with wagon valves for controlling the water The lock gates will be of the solid timber type and the upper gates to all cases will be set on the top of lift walls They will be operated by struts or bars working in hand power winches set in recesses which will be formed in the lock walls

The total cost of the improvement of this part of the Trent Navigation will amount to about $7 750 000 the first vote for which was made by Parliament during the session of 1907 The project involves the removal of about one and a half million cubic yards of earth one and a quarter million cubic yards of loose and solid rock and the building of about four hundred thousand cubic yards of concrete

Engineer

As to The Future

THE advocates of the construction of the Trent Canal as a means of through navigation from Lake Huron to Lake Ontario are to day more than ever convinced that when the waterway is completed it will be an important factor in the grain carrying trade between the great west and the Atlantic seaboard. While it has up until a few years ago received very little support from the large industrial centres of Canada not situated upon its route and which may not derive any immediate benefits from its completion it is to-day, with the great increase of wheat production and transport necessity generally speaking, receiving the hearty support of every section of the Dominion of Canada. The present Minister of Railways and Canals, Hon. G. P. Graham, has displayed keen interest in the project and the work of completing the waterway has proceeded under his administration with greater vigour than at any time in its history. A certain section of the press of Canada too, has at times been more or less hostile towards the project but those who have for years fought so determinedly in its behalf are hopeful that in a few years hence they will see barges laden with grain from the great West, passing down its course.

The old Erie Canal with its draft of slightly more than five feet can hardly in the matter of carrying capacity be compared with the Trent Canal with its draft of 9 feet 6 inches yet the advocates of the Trent waterway point with pride to the part the Erie Canal has played in the transportation interests of the United States. It is pointed out that the undeniable benefits which have been derived from the Erie Canal in the past are not disputed by any one. To it more than to any other one cause is due the phenomenal growth and commercial supremacy of the City and State of New York. It opened up the great West to settlement and in turn attracted the produce of the West to the low grade line through the Appalachian chain which exists only in the State of New York. This tells on this waterway have more than repaid the cost of construction, maintenance, and operation in addition it has paid over $300 000 000 00 of freight money within the limits of the State and the disbursement of this money along the line of the Canal has built up the great interior cities from Boston to Albany forming a continuous line of commercial centres which has no counterpart in any other State. The growth of these Cities in turn led to the construction of rails ays parallel ing the Canal and these by consolidation and scientific management have gradually reduced the cost of transportation with all the advantages such a reduction necessarily brings. With the completion of the Trent Canal not only will transportation rates generally be reduced to points along its route, but a good percentage of the grain that passes through the Soo Canal on its way from the West will be conveyed in barges by way of the Trent to Montreal and the seaboard.

One of the ablest speeches that has ever been delivered on the practicability and desirability of the Trent Canal and its possibilities as a factor in through transportation was made by Mr. R. R. Hall who some four years ago represented West Peterborough in the Dominion House of Commons. Mr. Hall, who had given the Trent Canal and its future a most careful study in addressing the House on the matter amongst other things said:

The consumption of coal in the City of Peterborough last year was 43 430 tons. The rate on coal from Suspension Bridge to Peterborough by rail is $1 25 a ton. Coal is delivered in Oswego at 15 cents a ton cheaper than at Suspension Bridge. Freight between Oswego and Trenton or Port Hope is 25 cents a ton and the rate between Port Hope and Peterborough by rail though only a distance of 30 miles is 80 cents a ton. On coal alone the freight from Trenton to Peterborough were the Canal completed would not be more

than 25 cents per ton On that basis there would be a clear saving on coal to Peterborough of 75 cents a ton or on the amount consumed last year a total saving of $32 500

After dealing very exhaustively with the project Mr Hall concluded by saying

"When you take into consideration the fact that we have the means right in the very heart of the Province of Ontario of establishing a 750 ton barge Canal which will have a capacity of carrying practically two and a half train loads of grain from Midland to Montreal I think you will admit that it is a matter deserving of the most serious consideration and that the Canal is a work which should be immediately gone on with as part of our national system of grain transportation"

It will be observed that Mr Hall referred to the Trent Canal as a 750 ton barge waterway Since that time the Government decided on building the new sections of the Canal with a draft of 5 feet 4 inches on the locksills, thereby providing for the use of 1 000 ton barges The Ontario-Rice Lake section of the Canal is being built with an 8 foot 4 inches draft and any renewals that may be made from time to time on the older portions of the Canal will be on the same scale

A SMALL SECTION OF STONEY LAKE

THE GOVERNM[illegible] BERT F. BUTLER TAKING MR. WILLIAM JENNINGS BRYAN OVER THE PETERBOROUGH HYDRAULIC LIFT LOCK. MR. BRYAN MAY BE SEEN STAND NG OVER THE WOR[illegible] BUTLER

As To Power Development

The Trent Canal as a producer of electrical power is doing much towards the industrial development of that section of the province of Ontario. Roughly speaking, the various dams along the line of the Trent Canal from Lake Simcoe to Trenton are capable of developing 100,000 electrical h.p. Of course all the dams are not at the present time developed for the reason that the distance is not as yet able to handle all the power that is in sight. However, the demand is rapidly increasing and new dams along the canal are each year being developed and the towns and villages for many miles adjacent thereto are being supplied with light and power at as low rates as the Niagara district which is supposed to have the cheapest light and power in the province.

Every available water power along the route of the Canal with one or two exceptions, has been acquired either by municipalities, or by private companies. The ownership of these powers was acquired many years ago and in constructing the canal riparian rights were a matter that gave the Government considerable difficulty. However all matters of this kind are now adjusted and while the Government does not receive a revenue from all the water powers on the Canal certain dams however which were taken over by the Government and improved are revenue producers in so far as the Government is concerned. The leases provide for the use by the power companies of the surplus water after the interests of navigation have been served. It is estimated that the rentals for surplus water at various dams will when fully developed yield a revenue to the Government of Sixty or Seventy Thousand Dollars per year.

The following tables give the location of the dams with their respective lifts and hydraulic power on the line of the Trent Canal:

FROM LAKE ONTARIO TO RICE LAKE

	H.P.
DAM No. 1.—17 miles from Trenton Junction. 17.5 ft. head. At ex tension low water of Lake Ontario a head of 20.0 ft. can be obtained. With a 17.5 ft. head the amount of h.p. developed is	3,977
DAM No. 2.—23.4 miles from Trenton. 20 ft. head	4,546
DAM No. 3.—At Glen Miller. 4.6 miles from Trenton. A 27 ft. head can be developed here only with the consent and in conjunction with Messrs. Miller Bros. Limited who are now using a head of 8 ft. In the event of Messrs. Miller Bros. Ltd. not consenting a head of only 18 ft. can be obtained. A 27 ft. head would produce	6,127
DAM No. 4.—6.3 miles from Trenton having a head of 18 ft.	4,060
DAM No. 5.—6.6 miles from Trenton having a head of 10 ft.	4,060
DAM No. 6.—At Frankford. 5.1 miles from Trenton. 16 ft. head. The surplus water at this point is owned by The Trent River Paper Company. There is developed here	3,636
DAM No. 7.—At Glen Ross. 14.3 miles from Trenton. By a large expenditure of money a head of 6 ft. at this dam could be obtained. During high water the present head of 6 ft. at this dam may be somewhat reduced. A 6 ft. head would produce	1,180
DAM No. 8.—At the foot of Myer's Island. 26.4 miles from Trenton. A 30 ft. head can be developed at this dam by the excavation of about 25,000 cubic yards of rock for a tailrace and a 36 ft. head can be obtained at a still greater cost for tailrace excavation in rock. There is a 26 ft. head available without any tailrace excavation. A 30 ft. head would give	6,617
DAM No. 9.—At the head of Myer's Island. There is a 24 ft. head available without any expense or in fact excavation. With considerable tailrace excavation a 28 ft. head can be obtained which would develop	5,434
DAM No. 10.—At Ranney's Falls just below Campbellford and 30.0 miles above the town of Trenton. A 48 ft. head is in course of development in the vicinity of Lock No. 12	10,000
DAM No. 11.—Known as Stephen's Rapids, just above the Town of Campbellford. The power at this point is developed by the Seymour Power Company. There is a head at this point of 30 ft. Amount of power developed	4,227

DAM No 12.—At foot of Crow Bay This power is developed by the Municipality of the Town of Campbellford The head is 35 ft Power developed is 8,681

DAM No. 13.—At Healey's Falls, 14 miles below the Village of Hastings. A head of 70 ft. can be obtained at this dam by the expenditure of considerable money in tailrace excavation This is considered the most valuable water power on the entire Trent system and is under lease to the Seymour Power Company (The Electric Power Company, Limited.) It is not yet developed but with a 66 ft. head will produce 12,250

DAM No. 14.—At Hastings owned and developed by the Fowlds Company There is a head of 9 ft which is slightly reduced during the high water season. A 9 ft. head will give 1,834

Total amount of h. p. available between Lake Ontario and Rice Lake 74 403

The flow of the Trent River from below Healey's Falls to Trenton is estimated at 120 000 cubic feet per minute At Healey's Falls and Hastings the flow of the river is estimated at 90,000 cubic feet per minute

FROM RICE LAKE TO STONY LAKE

DAM AT LOCKS just below the City of Peterborough This dam is not developed. It has a head of 8 ft. at low water, but during the high water season this almost disappears hence the power is of little value. However, if a head of 3 ft could be maintained and taking the flow of the river at 90 000 cubic feet per minute, the amount of power available would be 1,090

DAM AT LONDON STREET Peterborough, owned and developed by the Peterborough Hydraulic Power Company (The Quaker Oats Company) 2 400

DAM AT AUBURN, owned and developed by The Peterborough Light and Power Company (The Electric Power Company Limited) 1 900

DAM KNOWN AS WATERWORKS DAM just above City of Peterborough owned and developed by the City of Peterborough 1 500

NASSAU DAM owned and developed by The Canadian General Electric Company 1,800

DAM No. 5 Peterborough Lansdowne Section Leased to and developed by the Dionahue Power Company. This dam along with No. 6 a short distance above, can be jointly developed to provide 4,300

DAM No. 8.—Leased to and developed by the Canada Cement Company 1 400

DAM No. 9.—Not yet developed owned by the Dominion Government 1,500

DAM No. 1.—Owned and developed by The Dickson Company of Peterborough 2,600

DAM AT YOUNG'S POINT—Owned and controlled by the Canada Cement Company 343

Total h. p. on this section 19 533

In the aggregate of the amount of available power on this section the figures furnished by the Ontario Hydro Electric Commission are used with the exception of the estimate on the dam just below the City of Peterborough and the Young's Point Dam The Hydro Electric Commission's estimate on the dams from Peterborough to Lakefield is considered to be very conservative the flow of the river being reckoned at 84 000 cubic feet per minute It is pretty generally conceded that the low water flow of the river from Clear Lake to Rice Lake is 90 000 cubic feet per minute.

FROM STONY LAKE TO CAMERON LAKE

BURLEIGH FALLS DAM.—Owned by The Electric Company (The Central Ontario Power Company) There is a head here of 20 ft Taking the flow of the river at 90 000 cubic feet per minute the amount of power that may be developed will be 3,900

BUCKHORN DAM.—Owned by the Electric Power Company. Not yet developed A head of 10 ft. Taking the flow of the river at 90 000 cubic feet per minute, the amount of power available here would be 1,700

BOBCAYGEON DAM.—Taking the flow of the river at 70,000 cubic feet per minute, with a 18 ft. head the amount of power available is 1,260

FENELON FALLS DAM.—The surplus water at this dam is owned and developed by the Light Heat and Power Company of Lindsay The head here is 24 ft. and the flow of the river is estimated at 45,000, giving electrical h. p. to the extent of 2,340
The total amount of h. p. on this section therefore is 6,000
8340

Few people realize that the 100 000 electrical h. p. capable of being developed along the Trent Canal from Fenaam Lake to Trenton is equal to 1 000 000 tons of coal for which we are paying the United States four million dollars annually

The 100 000 electrical h. p. above referred to does not include the power developed on the Severn River which flows from Lake Simcoe to Georgian Bay

VIEW OF RIVERVIEW PARK TAKEN FROM STREET RAILWAY WHARF PETERBOROUGH

VIEW OF THE PETERBOROUGH SIDE OF THE OTONABEE TAKEN FROM RIVERVIEW PARK SHOWING PETERBOROUGH WHARF AND STREET RAILWAY LINE

ANOTHER VIEW OF RIVERVIEW PARK TAKEN FROM THE TERMINUS OF THE STREET RAILWAY

As a Tourist Resort

THE route of the Trent Canal consists of a chain of lakes and rivers unsurpassed on the Continent in their varied attractiveness as tourist resorts. It is only within recent years that these picturesque waters have been commercialized in the matter of being advertised as tourist resorts but to-day there is not one available point or island on the lakes and rivers throughout the entire system that is not dotted with pretty summer homes and comfortable hotels maintained almost exclusively for the tourist traffic. The growth in the popularity of these waters as an ideal spot to spend the summer months has been really astonishing and to-day they are receiving a degree of advertising by railway companies equal to that given the much older established but no more attractive, resorts such as the Thousand Islands and Muskoka.

A certain section of the Trent Canal is commonly known as the Kawartha Lakes "Kawartha" is the Indian word for "Bright Waters and Happy Lands." They comprise fourteen beautiful lakes—Scugog, Sturgeon, Cameron, Balsam, Pigeon, Bald, Sandy, Buckhorn, Chemong, Deer, Lovesick, Stony, Clear, and Katchewanooka—to which may also be added Rice Lake, twenty-six miles down the Otonabee River below Peterborough.

The attitude of these famous lakes lends them additional charm for the tourist and pleasure seeker; some of them being 830 feet above sea level, over 600 feet higher than Lake Ontario, and 300 feet higher than Georgian Bay. On these charming waters the pleasure seeker will find delightfully cool wooded shores and sandy beaches, where bathing may be indulged in with safety.

The accommodation for travellers at the various points on these waters is much superior to the average summer resort. For those who wish to take their family for an outing, the cottage or camp on the shores of these waters affords a vacation at a very moderate expense. The hundreds of miles of shore and the many islands of the Kawartha Lakes specially lend themselves to the enjoyment of a summer outing. The Kawartha Lakes, being on the line of the Trent Canal, are linked together by narrows, locks and channels, which allow the boat of the pleasure seeker to pass from one to another until the whole chain is explored. The eye never has time to weary of one scene before the rounding of a point, the passage of a lock or the threading of the narrows, puts before you a new prospect. The dip of an oar, the stroke of a paddle, the twist of a tiller, or the turn of a pilot wheel is enough to bring a fresh ascension of the Kawartha panorama into view.

These Highland Lakes of Ontario are like and yet unlike the Scotch lochs. They do not possess the awful grandeur of those of Switzerland, nor the cold ruggedness of some of the Scotch lochs, yet there is about them an inspiration more subdued and peaceful, while every point and island, every bay and headland, glows with a sweetly picturesque beauty. Slowly threading a narrow passage between verdure-laden islets, the rounding of a point will suddenly bring into view a broad expanse of water, whose continuous shores seem to have no outlet, but hidden behind some island or projecting headland will be found a passage leading through Carolina labyrinth of beautiful scenery, and just as further progress seems impossible another miniature sea breaks on the view.

Lovely as were the Kawartha Lakes when Nature displayed them to advantage before the enthusiastic glance of Samuel de Champlain and his Indian allies, yet now, with all that Nature then did improved by the artistic hand of man, they are simply enchanting. Travellers in Scotland, or readers of Sir Walter Scott, or other descriptive works of The Bonnie Highlands, are not unfamiliar with the wild grandeur of the Scotch lochs, and all this magnificence is reproduced within the compass of the Kawartha Lakes. The more the scenery is studied, the more convinced one becomes that the charms which are spread out under a Canadian sky can vie with the most lovely which are scattered under distant climes. The student of geology, the botanist, and the amateur photographer find a field well worth while in the Kawartha country.

As for the canoeist, this midland district of Ontario is one broad continuous network of lakes extending to James Bay, and the voyageur to be taken by the enthusiastic lover of the canoe have but one limit—the time at the disposal of the voyager.

The Hydraulic Lift Locks

IN attempting to describe the hydraulic lift locks on the Trent Canal we can not do better than to reproduce a few extracts from a paper prepared by Mr Walter J Francis C E (Tor Univ) M Can Soc C E Mr Francis at the time of the construction of these locks, was in the service of the Department of Railways and Canals and had immediate charge of the work In January 1907 Mr Francis read a paper at the annual meeting of the Canadian Society of Civil Engineers, at Toronto, his subject being "Mechanical Locks in Canada" While space will not permit of our using the article in its entirety it is hoped that the extracts taken therefrom and published below will give the reader some slight idea, at least of the hydraulic lift locks on the Trent Canal Mr Francis said in part

Built for the Canadian Government by Canadian contractors, under the direction of Canadian engineers, the hydraulic locks on the Trent Canal may properly bear the label "Made in Canada" In view of the fact that the German Government has recently completed a high canal lift in Heinrichenburg, and that the United States Government has made a careful study of the problem of mechanical lifts in connection with the reconstruction of the Erie Canal, a detailed description of the Canadian hydraulic locks may be considered appropriate in the present issue

The largest of the two Canadian locks is situated on the Trent Canal within the limits of the corporation of the city of Peterboro and has been in operation since June 1904 The other lock, near the village of Kirkfield is in a stretch of canal joining Balsam Lake and Lake Simcoe

The hydraulic lock is theoretically an automatic machine and is designed to take the place of ordinary locks where a great difference of level is found in a short distance Besides the Peterborough and Kirkfield locks there are three other locks of this type in operation—one being in England—another in Belgium and the third in France The English lock has been in continuous use for over thirty years, while those in France and Belgium have been completed about twelve years. They all have a lift of nearly fifty feet The depth of water in the French and Belgian locks is 7 feet 10 inches, and the lock chambers are 140 feet long and nineteen feet wide Several others having similar dimensions are now being built by the Belgian Government The chief dimensions of the Peterborough Lock are 65 feet lift chambers 140 feet long with 33 feet clear width and 9 feet normal depth of water The Kirkfield lock has the same general dimensions with a lift of 50 feet It will be noticed that in the Peterborough lock the water load is double that of the larger European ones while the height of the lift is increased over thirty per cent

In principle the hydraulic lock may be likened to two immense hydraulic elevators of the simple plunger type, having their presses connected together so that the descent of the one causes the rise of the other In place of the ordinary elevator platform we have a large watertight box or tank closed at either end by a gate The leakage is performed by towing the vessel into the box of water and then closing the gate on the end of the box as well as that of the end of the canal thus leaving the box independent of the reach and free to move vertically The box with the water and the floating vessel is then raised or lowered to the other reach The chamber or box about to descend is loaded with a few inches more water than the other chamber thus giving it the necessary additional load or surcharge to enable it to cause the ascent of the other when water communication is established between the two presses The construction of the Canadian locks varies materially from those of Europe and as far as outward appearance goes there is little similarity The departures are largely due to the climatic conditions and to the different practices adopted by American and European engineers in steel construction

For purposes of detailed description the Peterborough lock will be taken first and the difference in the Kirkfield structure will be noted later in the paper

THE PETERBOROUGH HYDRAUL[illegible] LOCK FRONT VIEW

THE PETERBOROUGH HYDRAUL[illegible] FROM THE WE[illegible]

A gradual slope was selected for the site of the Peterborough lock and the excavation was completed in 1829. The location was chosen so that the average depth of excavation was about 40 feet and the material thus obtained was used in building embankments to carry the level of the upper reach to the back of the structure. The excavated material was found to be hard shaly mixed with small stones and boulders underlying a thin layer of fertile soil. At the upper end of the excavation a small amount of hardpan was encountered and below this a shaly limestone rock. The rock was in layers of from 2½ inch to 8 inches in thickness between which were thinner layers of clay and shaly material. The layers of crystallized limestone stand the weather quite well but the shaly parts disintegrate very rapidly under the action of rain and frost. The elevation at which rock was found was exceedingly fortunate being practically at the bottom of the pits. When the rock was cleaned off less than two feet of concrete brought the floor to its proper grade. No footings were required under any of the walls, all being built upon the solid rock.

After dealing in detail with the excavation of the press walls in which the large presses stand Mr. Francis' paper gives a description of the substructure of the lock. It is built entirely of concrete and contains a little over 26 000 cubic yards. The breast wall is forty feet thick and 80 feet high, the length being 126 feet at the base. The towers, three in number are on the same transverse centre line as the walls. In round numbers, the total height of each tower from rock bottom to top is 100 feet.

"The earth embankment upon which the canal is carried up to the back of the breast wall was built in layers about 8 inches in thickness, thoroughly compacted and rolled. During the hot and dry season the earth filling was liberally watered. The material was clay containing small stones. This method produced an embankment having the remarkable record for settlement of only about 1-40 feet in a period of nearly a year where the depth of made earth was upwards of forty feet.

"The contract for the embankment and substructure was executed by Messrs. Carry & Laverdure of Ottawa and completed in 1902."

Dealing with the superstructure Mr. Francis says:—

"The superstructure of the Peterborough lock was built by the Dominion Bridge Company of Montreal. The work was commenced in the summer of 1901 and the structure was completed early in July 1904. The cost of the superstructure complete was $244 000 00.

"Each of the lock chambers is 130 feet x 33 feet with 8 feet 10 inches of plating on the sides. These dimensions, with the exception of the depth of water were fixed by a Government Commission. It is also necessary that a clear headway of 25 feet be left above the water level. The depth of water for which the lock is constructed would, in ordinary navigation language, be called 8 feet on the sills. The load of water which each of the lock chambers contains is 1 300 tons and this is the maximum load which it is necessary to provide for since a floating vessel displaces only her own weight of water."

The structural steel work was minutely described by Mr. Francis as well as the gates and their mechanism and the main presses and rams. After manufacture and before erection all the castings of the presses were subjected to a rigid hydraulic test at a gauge of 1 200 lbs. per square inch being twice the working pressure.

As to the materials and general appearances Mr. Francis says—

A summary of the amounts and various kinds of metal used in the superstructure is as follows:—Rolled steel in plates and shapes for the lock chambers and gates 1 640 000 lbs.; cast iron in rams accumulator guides and various machines 495 000 lbs.; steel castings for the main presses and accumulator 648 000 lbs.

"Care has been taken throughout to make the general appearance of the work as attractive as possible. All the walls and stairways are protected by suitably designed railings and the windows and doorways are closed by ornamental grille-work. The lockmaster's cabin on

the top of the centre tower is constructed of concrete as high as the window sills Above this the steel frame work is furred with wood and the whole of the exterior covered with copper The interior is finished in British Columbia cedar in the natural color

Many people who visit the hydraulic lift locks and see them in operation are at first puzzled to know how the space between the lock chamber and the frame of the reach gate is made water tight Mr Francis explains this thus

"There is a space of nearly 2 inches between either end of the lock chamber and the frame of the reach gate When it is desired to connect the lock chamber with a reach this clearance space has to be closed This is done by having a collapsible rubber tube fastened to the frame of the reach gate and arranged so as to lie flat When the lock chamber is in position for communication the rubber tube is inflated with air at about 10 pounds per square inch pressure, which causes it to expand and press against the end of the chamber

The operation of the lock is described by Mr Francis as follows —

The operation of the hydraulic lock requires three men—a lockmaster and two assistants or gatemen The lockmaster is in charge and is responsible for the structure Two gatemen are required one at the lower and one at the upper to open and close the gates to inflate or deflate the seal tubes and to operate the capstans The gatemen also take charge of vessels at about 200 feet on either side of the lock The lockmaster during operations stays in his cabin on the top of the centre tower and has full view of all that transpires He is also in communication with his two assistants by a simple signal system The lockmaster has before him the principal levers and through an interlocking system regulates the working of the lock The levers for controlling the gate engines and the capstans are situated on the wall immediately above the respective machines convenient of access to the gatemen The interlocking system is so arranged that the lockmaster must set his levers in proper order and these having been set another he nor the gatemen can err by using their levers at the wrong time

"In order to get a clear idea of the complete mode of operation let us assume that both lock chambers are down at the lower level empty as they are at the end of winter or when it is desired to prepare them for navigation purposes The annular space in each of the presses if empty will be filled with water The main valve on the connecting pipe will be closed and water will be pumped into one of the presses until the ram with its superimposed chamber rises to the level of the upper reach An examination of the case will show that it is necessary that the uppermost chamber in order that it shall be able in descending to cause the other to take the full upward stroke must contain a volume of water greater than the rising chamber contains This extra amount is equal to the volume of one of the rams since the change that takes place during the relative motion of the two chambers is that the ram of the descending chamber becomes constantly immersed while the other protrudes In other words the descending chamber is losing weight while the ascending is constantly becoming heavier It is also necessary that some extra weight be provided in to overcome the friction of the guides and of the stuffing boxes of the main presses The area of each lock chamber is so great that it requires only an additional depth of 3¾ inches to give an extra load of water of 100 tons which is sufficient for ordinary operation The add ition to this weight will of course have the effect of accelerating the time of the relative change in position of the chambers This ordinary time required in raising the chamber through the whole elevation is about two minutes But this will depend upon the adjustment of the ram glands the nicety of the working of the guides and the manipulation of the main valve in the hands of the lockmaster

"An ordinary leakage is conducted in this manner Suppose 100 tons of surcharge has been found to give sufficient additional weight to the descending chamber The uppermost chamber will then be required to sink with its floor 3¾ inches lower than the bottom of the upper reach On communication being established with the reach it receives from the reach 100 tons more than the lower chamber contains assuming the depth in both reaches to be the same Thus the total operations to make the leakage of the gates adjoining the reaches are

opened and the seal tubes are inflated connects in hauling the vessel into the chamber and moor ing her there securely closing the gates defeating the seal tubes and opening the main valve between the presses The heavier chamber then commences to descend the motion being al lowed to increase gradually by the gradual opening of the valve until it reaches the maximum speed At about three quarters of the stroke the main valve is slowly closed communication between the presses being entirely cut off when the end of the journey is reached The change in elevation being made, the seal tubes are inflated the gates are opened and the vessel or vessels are free to go on their journey, after being towed out by the capstans The surcharge contained in the descending chamber simply flows out into the lower reach while a similar quantity to perform the next lockage is admitted into the chamber which has just reached the higher elevation

The record lockage so far, at the Peterborough lock is 8½ minutes being the whole time from the stopping of the vessel in the lower reach to her proceeding on her journey under her own steam in the upper one

The Reservoir Waters

THE Trent Canal district may be said to have furnished to Ontario the first real practical demonstration of the value of water conservation While the Trent Canal has been heard of for many years and has in its day constituted a sort of political football with which perhaps both of the great political parties have played it is, at the same time, as a canal a waterway for the transportation of the products of the country, that it has been advocated and to which it has invariably been referred This waterway which when completed will run through the midland counties of Ontario, connecting Georgian Bay with Lake Ontario at Trenton consisting a route for barges of 8 feet 6 inches draught fully 250 miles shorter to Montreal than by the Welland Canal is in reality nearing completion It will therefore be a matter of a short time only until the advantages of this route will have an opportunity of demonstrating to the world if they can that the Trent Canal projected nearly 75 years ago can carry grain from Midland to Montreal at cheaper rates and in faster time than by the Welland route

However it is not along this line that I am now going to discuss the Trent Canal but rather as a means by which electrical power has been developed along its route and the factor it is playing in the industrial development of its district Next to the Niagara there is no district in older Ontario at least in which the water falls are being developed to a greater degree than along the line of the Trent Canal There has been a number of small power dams on this waterway for many years back at which power has been to a limited extent developed It has been during recent years only however that the great possibilities of power development on the Trent Canal have been fully realized Efficient and modern power houses are now looming up at the various dams, and the district thereabout is becoming a busy work of power transmission lines

This is due to two main reasons Firstly it might be stated that the final adoption that the route the Canal should take at certain points and the erection of substantial new concrete dams by the Dominion Government for Canal purposes made many valuable sites available for the development of power These dams are at the present time practically all acquired Most of them are already being used in the development of electrical energy and the remainder of them are about to be utilized They are owned by various private persons joint stock companies and municipalities The nature of the sites to and power privileges in connection with those dams vary considerably Some of them are owned outright by private individuals and they are entitled to all the surplus water without any yearly rental The dams thus held were secured many years ago either before a sound was seriously thought of or before the value of water powers was understood Other dams are merely leased from the Government (the terms of the leases varying) upon payment of a certain annual rental being based of course upon the amount of power developed Such dams as these are now placed under the control of the Railway Commission in so far as the matter of rates to consumers of power is concerned This was a very wise move on the part of the present Minister of Railways and Canals as it ensures to the public the delivery of power at a reasonable price

But the remarkable development of electrical power on the Trent Canal is not due to this alone The flow of the Otonabee and Trent Rivers, on which the great portion of the power is developed has by a judicious and aggressive policy of conservation been increased to such an extent that it has contributed perhaps to a greater degree than the construction of new dams to the present highly satisfactory state of affairs and has indirectly also contributed to the development of the towns and villages along the route of the Canal When it is realized that the flow of the Otonabee River at Peterborough has increased over 100 per cent during the past five years one can realize that water conservation on the Trent Canal has been a reality

The city-fro

Until five years ago the waters of the Trent Canel and the waters of what is known as the Trent Canal watershed were under separate management That is the main lakes and rivers that constitute the Trent Canal proper were under the control and management of the Dominion Government while the "feeders" thereto were under the control of the Government of the Province of Ontario

It must be borne in mind that the County of Haliburton and those portions of the counties of Peterborough and Victoria north of the main line of the Canal contain almost countless lakes of various depths and sizes A glance at a map drawn on a reasonably large scale, on which these lakes are shown would undoubtedly surprise one who is not personally familiar with the locality Some of these lakes are quite large Kinkstone for instance in the township of Guilford having an area of 3 051 acres Kenteese, in the township of Havelock having an area of 3 833 acres, and Gull Lake in the township of Lutterworth having an area of 2 748 acres These lakes empty into various streams that finally discharge into the Trent Canal The two of the largest of these are known as the Gull River which flows into Balsam Lake at Coboconk and the Burnt River which flows into Cameron Lake just above Fenelon Falls

However there are other streams that are valuable as "feeders" to the Trent Canal a full list of which together with the areas in acres of their basins, is as follows

	ACRES		ACRES
Gull River basin	40 864	Deer Bay Creek basin	2 547
Burnt River basin	22 950	Buckhorn Creek basin	955
Nogies Creek basin	1 571	Squew River basin	342
Mississaugua basin	7 002	Jack s Canek basin	4 196
Ball s Creek basin	2 683		
		Total	83 211

This does not include the Crow Bay waters which empty into the Trent River below Healey s Falls Crow Bay waters are still under the control of the Ontario Government

During the year 1904 legislation was started by the power users along the Trent Canal as well as by the navigation interests to have the control of above-mentioned watershed or what is now commonly known as the reservoir waters transferred from the Province of Ontario to the Dominion Government In order that there might no longer be a dual system of management in connection with the water that finally passes through the Otonabee and Trent rivers on the main line of the Canal Until that time the normal flow of the Otonabee River at Peterborough was 44 000 cubic feet per minute There was no uniform flow of water for the reason that it was practically impossible under the conditions then existing to control it

At certain periods of the year—during the spring and early summer—an unnecessary amount of water came surging down the Otonabee and Trent Rivers which by the month of August there was not enough water to drive the wheels of the various power houses on the Canal or supply the requirements of the navigation interests This state of affairs was due to the fact that those in charge of the tributary waters had no interest whatever in these streams other than to assist the lumbermen in getting out their logs The Ontario Government had built timber dams at the outlets of many of these lakes, which were controlled by the Provincial Department of Public Works The dams were built and operated in the interests and for the sole benefit of the lumbermen When the lumbermen would drive out of the various lakes there would be an abnormal and unnecessary flow of water come down into the main Canal The stop logs would remain out until the following spring when the same process would be gone through

It was argued and quite properly so that if the entire water of the Trent Canal watershed together with the water in the main line of the Canal were placed under one management a system of conservation could be inaugurated whereby without any interference with the rights of the lumbermen a steady and increased flow could be made to pass down the

Otonabee and Trent Rivers at all seasons of the year It was of course contended that the control should be vested in the Dominion Government In view of the requirements for navigation purposes After some months of negotiation in which prominent men of the district regardless of political creed took part, the transfer to the Dominion Government was made in July 1905 the Provincial Government handing over all lakes rivers, and streams tributary to the Trent Canal north of Peterborough The Dominion Government agreed to protect the rights of the lumberman in respect of the use of dams on these streams and guaranteed to them all privileges they had hitherto enjoyed

The Department of Railways and Canals under whose control this splendid watershed now came at once got busy Money was voted for the repair, rebuilding and improving of the dams at the outlets of those various lakes The old timber dams were in many instances replaced by substantial concrete structures Others were repaired and rightened and in mostly every other case the dams were raised by many feet over their former level On the various streams good competent and experienced men were placed to operate the stop-logs at the different dams and an almost perfect system was built up The result of the work is thus let most surprising. The water is now conserved in the springtime the lumbermen s drives are taken out with care and by using only what water may be absolutely required The stop logs are immediately replaced after each drive passes out, and the water is bottled up until such time as it may be required in the late summer or fall months, on the main Canal

The beneficial results are clearly indicated The flow of the river Otonabee was increased to 30 000 cubic feet per minute being just twice the flow it was five short years ago Power development of each dam has correspondingly increased and more power is according ly available for distribution throughout the district

It must be borne in mind that the system is not yet extended to the full limit of its possibilities Each year more new reservoir dams are being built and for some years to come there will be scope for still further improvement An extreme dry spell may to some slight extent tax the present greatly increased capacity of the various power plants, yet there is not a power company operating on the Trent Canal especially from Peterborough down that will not say that the flow of water in the Trent Canal has been steadier more uniform and 100 per cent greater throughout the entire year than it was five and six years ago

There is no doubt therefore that water conservation in this district has been successful to a most surprising degree There is no doubt also that the successful working out of this policy has resulted in great industrial growth which is as yet in its infancy. It the reason that many of the best dams of the Trent Canal are only now being harnessed with a view to supplying the very attractive market which awaits it

It is only fair to say that the success of this scheme is to a very large measure due to the superintendent of the Canal Mr J H McClellan who has given the matter a thorough study and has maintained throughout that degree of enthusiasm with which he some years ago entered upon the work

THE KETCHECUM LAKE HUNT CLUB KETCHECUM LAKE IS ON THE TRENT CANAL RESERVOIR SYSTEM

188,465 Acres of Water

IT may surprise many to know that the area of the various lakes that form that portion of the Trent Canal from Balsam Lake to Trenton is 88 079 acres To this may be added the area of what is commonly termed the Reservoir Waters and which is 99 359 acres This therefore would mean that exclusive of the many fairly large rivers and streams there are 188 438 acres of water flowing continuously down through the Trent This area is made up as follows

RESERVOIR WATERS

	ACRES.		ACRES
Gull River basin	40 864	Jack's Creek basin	4 198
Burnt River basin	22 950	Crow River basin	16 149
Negues Creek basin	1 671	Deer Bay Creek basin	2 547
Mississaugua basin	7 002	Buckhorn Creek basin	655
Eel's Creek basin	2 683		99 360
Squaw River basin	341		

	ACRES		ACRES
Balsam	10 300	River Buckhorn to Burleigh and	
Cameron	3 109	Deer Bay	4 140
Scugog	16 000	Stony and Clear	10 875
Sturgeon	9 200	Rice	17 000
Pigeon	3 064		
Chemong	5 400		89 079
Buckhorn	8 000	Total	188 439

Of course Lakes Simcoe and Couchiching which are on the line of the Trent Canal have an area of 295 square miles Their waters however flow through the Severn River into Georgian Bay and after flowing over Niagara Falls join their neighbouring waters of Balsam Lake in the Bay of Quinte

The Crow River basin of 16 149 acres, flows into the Trent Canel just below Healey Falls The Superintending Engineer of the Canal in his annual report to the Department estimates the low water flow of the Trent River below the point at which the Crow River enters at 2 000 cubic feet per second while at Healey's Falls his low water estimate is 1 500 cubic feet per second

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The Charts Explained

In making a trip over the Trent Canal yachtsmen and others who may desire to refer to the charts hereon will observe that these charts have been arranged in the following order

1 Chart of Lakes Couchiching and Simcoe
(From the entrance to the Canel near Beaverton to Balsam Lake no chart is required the channel following the Talbot River for some distance and the remainder of the distance being through an artificial reach)

2 Chart of Balsam Lake and Cameron Lake

3 Chart of Sturgeon Lake

4 Chart of Pigeon Lake

5 Chart of Buckhorn Lake and Chemong Lake

6 Chart of Deer Bay and Lovesick Lake from Buckhorn to Burleigh

7 Chart of Stony Lake and Clear Lake
(The channel from Young's Point to Peterborough through Lake Katchewanooka and the River Otonabee is easily located without the aid of a chart)

8 Chart of Otonabee River and Rice Lake

Height of Locks

The following table gives the location of the locks with their respective lifts on the Ontario-Rice Lake Section now under construction

NO OF LOCK	MILES FROM TRENTON	LOCALITY OF LOCK	LIFT OF LOCK
1	1 8	Trenton Junction	20 ft
2	2 4		20 ft
3	3 0	Glen Miller	27 11
4	5 2		18 ft
5	6 4		18 ft
6	7 3	Frankford	16 ft
7	13 6	Glen Ross	9 ft
8	25 2	Percy Landing	20 ft
9	26 4		16 ft
10	27 8		24 ft
11	29 6	Ranney Falls	24 ft
12	29 6	Ranney Falls	24 ft
13	32 1	Campbellford	23 11
14	33 6	Middle Falls	28 ft
15	36 1	Crow Bay	22 ft
16	36 5	Healey Falls	27 ft
17	36 5	Healey Falls	27 ft
18	51 0	Hastings	9 ft

It will be seen by the above table that the total lift from Lake Ontario to the reach above the Hastings lock is 360 feet The new lock at Hastings replacing the old lock built about the year 1837 was thrown open for traffic this spring and there is once again through navigation to Healey s Falls

The following table gives the location of the locks with their respective lifts on the navigable portion of the Canal from the Otonabee River below Peterborough to Balsam Lake the summit waters of the Trent Canal

	LENGTH BETWEEN QUOINS	WIDTH	DEPTH ON SILL	LIFT
1 Lock at Peterboro	134 ft	33 ft	6 ft	8 ft
1 Lock at No 6 Peterboro Lakefield Division	142 ft	33 ft	6 ft	12 ft
1 Lock at Peterboro hyd sulic lift lock No 1	140 11	33 ft	6 ft	65 ft
1 Lock at No 5 Peterboro Lakefield Division	142 ft	33 ft	6 11	14 11
1 Lock at No 4 Peterboro Lakefield Division	142 ft	33 ft	6 ft	12 ft
1 Lock at No 3 Peterboro Lakefield Division	142 ft	33 ft	6 ft	12 ft
1 Lock at No 2 Peterboro Lakefield Division	142 ft	33 ft	6 ft	10 ft
1 Lock at No 1 Peterboro Lakefield Division	142 11	33 ft	6 ft	16 ft
1 Lock at Young s Point	134 ft	33 ft	6 11	8 ft
2 Locks at Burleigh each 11½ ft (Upper)	134 ft	33 ft	6 ft	
(Lower)	150 ft	33 ft	6 ft	23 ft
1 Lock at Lovesuck	134 ft	33 ft	6 11	4 ft
1 Lock at Buckhorn	134 ft	33 ft	6 ft	9 ft
1 Lock at Bobcaygeon	134 ft	33 ft	6 ft	7 ft
2 Locks at Fenelon Falls each 12 ft (Upper)	134 ft	33 ft	6 ft	
(Lower)	150 ft	33 ft	6 ft	24 11
1 Lock at Rosedale	175 ft	33 ft	6 ft 4 in	4 ft

It will be observed that the lift from below the City of Peterborough on the Otonabee River to Balsam Lake is 227 feet

Ferby

The following table gives the location of the locks with their respective lifts, after leaving Balsam Lake and ascending to Lake Simcoe

	LOCK NUMBER	LENGTH BETWEEN QUOINS	WIDTH	DEPTH ON SILL	LIFT
1 at	Kirkfield hydraulic lift lock	No 2	140 ft	33 ft	6 ft	50 ft
1 at	No 1	Simcoe-Balsam Lake Division	142 ft	33 ft	6 ft	21 ft
1 at	No 2	Simcoe Balsam Lake Division	142 ft	33 ft	6 ft	14 ft
1 at	No 3	Simcoe Balsam Lake Division	142 ft	33 ft	6 ft	14 ft
1 at	No 4	Simcoe Balsam Lake Division	142 ft	33 ft	6 ft	14 ft
1 at	No 5	Simcoe-Balsam Lake Division	142 ft	33 ft	6 ft	11 ft

It will be observed that Lake Simcoe is 124 feet lower than Balsam Lake

---

The Cost of Construction

The following table shows the amount spent each year and the total amount spent to the 31st March, 1910, on the Trent Canal chargeable to Capital Account

Government expenditure prior to Confederation	$ 309 371 34	1895	53 907 70
1890	561 50	1896	332 876 08
1881	——	1897	486 575 70
1882	——	1898	351 273 31
1883	46 767 16	1899	166 611 46
1884	120 393 61	1900	334 583 01
1885	121 382 84	1901	284 803 89
1886	75 103 30	1902	449 075 45
1887	179 541 63	1903	523 980 74
1888	114 876 35	1904	459 938 44
1889	47 592 13	1905	333 261 75
1890	58 944 50	1906	316 780 46
1891	8 926 46	1907	153 045 42
1892	4 457 28	1908	343 176 05
1893	5 582 47	1909	1 099 836 38
1894	3 412 32	1910	1 000 000 00
		Total	$7 873 501 09

Some Distances

The following table of distances on the Trent Canal may be found both useful and interesting.

ON MAIN LINE OF CANAL	MILES
Port Severn to Washago *via* Severn Bridge	31 0
Washago to Narrows	10 0
Narrows to Gamebridge	18 0
Gamebridge to Balsam Lake	10 0
Balsam Lake to Rosedale River	5 0
Rosedale Bridge to Fenelon	4 0
Fenelon to Bobcaygeon	14 5
Bobcaygeon to Buckhorn	16 5
Buckhorn to Burleigh	7 0
Burleigh to Young's Point	9 0
Young's Point to Lakefield	5 0
Lakefield to Peterborough	10 0
Peterborough to Rice Lake	21 0
Rice Lake to Birdsall's	12 0
Birdsall's to Hastings	4 0
Hastings to Trent Bridge	8 0
Trent Bridge to Healey's Falls	6 2
Healey's Falls to Campbellford	6 15
Campbellford to Chisholm's	17 5
Chisholm's to Frankford	8 4
Frankford to Trenton	7 5

ON CHEMONG LAKE	
Chemong Park to Buckhorn	13 8
Chemong to Bobcaygeon	18 75

ON CLEAR AND STONY LAKES	
Young's Point to	
End of Clear Lake	4 0
Juniper Island Store	6 0
Boschink	9 0
Crow's Landing	12 0
Head of Lake	15 0
Juniper Island to Burleigh	3 36
Crow's Landing to Burleigh	8 5

ON OTONABEE RIVER	
C P R Bridge to G T R Bridge (Peterboro)	1 20
Wolfe St Wharf to lower end of Peterboro Lock	1 40
Wolfe St Wharf to Rye's Boat House	1 75
Lower End Peterboro Lock to Crawford's Grove	1 37
Wolfe St Wharf to Crawford's Grove	2 77
Wolfe St Wharf to Hale's Bridge	6 90
Peterboro Lock to Hale's Bridge	5 40
Hale's Bridge to Bamfort Bridge	3 90
Wolfe St Wharf to Wedlock's	18 70
Wolfe St Wharf to Jubilee Point	21 20
Wolfe St Wharf to New Cut	21 90
Bamfort Bridge to Wedlock's	5 00
Wedlock's to Jubilee	2 50

HORSESHOE LAKE DAM ON GULL RIVER
THIS IS ONE OF THE RESERVOIR DAMS ON THE TRENT CANAL WATERSHED

THE FOURTH BRIDGE
THIS IS A CONCRETE ARCH BRIDGE OVER THE TRENT CANAL ON THE BALSAM LAKE-LAKE SIMCOE SECTION

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ORILLIA

IN view of the commercial importance of the construction of the Trent Valley Canal it is natural that the attention of those interested in this great project should be riveted on the Town of Orillia, which is rapidly becoming the great Industrial Centre of Northern Ontario. Orillia, which is situated on the western shore of Lake Couchiching and which also overlooks Lake Simcoe has up only developed into a town of importance its location and the push enterprise and energy of the townspeople have been the chief elements to make it what it is. Orillia is a progressive prosperous and healthful town of six thousand five hundred people. Not the least of her great advantages is her easy accessibility and her excellent railway and transportation facilities. Three great Railways now run through the Town. The Grand Trunk. The Canadian Pacific and The Canadian Northern which will mean rapid development for her industries as transportation rates will be the closest and the best. As an example of the enterprise of her citizens Orillia was the first Municipality in Ontario to develop a Water Power and install an Electric Power Transmission Plant which was done in 1900 at the Severn River, and all her industries are now run by electricity. A low and special rate is offered to all industries and many of these have been brought here through this attractive power rate. From this Plant twenty two hundred horsepowers is being used at the present time for Municipal and Manufacturing purposes and one thousand horse powers is now being added. There are one thousand men employed in the various factories. The Tudhope Motor Company employ three hundred men. The Tudhope Carriage Company two hundred. The Canada Rubber and Smelting Company installed their new plant in the town in the fall of 1910, and are now enlarging their plant to at least double its capacity. The Canada Wood Specialty The Long Manufacturing Company The Eaton Planing Factory together with various other Manufacturing Concerns are all running to their full capacity and contemplate extending their plants. These and other industries have meant growth for the town and during the last year the population increased by more than seven hundred. Building of various kinds is going on in every direction and it has been carefully estimated that over one quarter of a million dollars worth of building and improvements will be done within the town limits during this season. The optimist expects Orillia to outgrow her town status during the next five years and to have become the Industrial City of Northern Ontario.

From a Summer Resort standpoint the town is well known and her principal charms arise from her situation on the two beautiful lakes Couchiching and Simcoe. Lake Couchiching is about thirteen miles in length and five miles in width, and contains many beautiful islands. The whole region is full of scenic beauty and is a delight to all lovers of nature. One of the principal attractions of the town from a Summer Resort standpoint is its splendid fifteen acre lakeside park, known as Couchiching Beach Park, which also forms the recreation ground for the townspeople and tourists. Boating is one of the favorite pastimes in Orillia and fair amounts of sturdy oarsmen sail in craft and motor boats are everywhere in evidence. Tennis has many devotees and tennis courts are found on many of the citizens lawns. For those fond of golf there are excellent golf links and these are patronized daily by a large following. Orillia is a town of well shaded streets of exceptionally fine homes of beautifully kept lawns and of fine churches, schools and even build ngs. On the shores of the lake are situated the summer homes of people from Canadian and American cities. Some come from as far south as New Orleans.

Orillia with the two fold advantage of being an industrial and railway centre as well as summer resort must become one of the most important towns along the route of the Trent Canal. Lakes Simcoe and Couchiching form a link in this great waterway system and both empty into the Severn River which will be the outlet of the Canal to the Georgian Bay. Surely such a grand location on the junction of the Trent Canal and the three Transcontinental railways must give promise of a greater future for the already progressive attractive and flourishing Town of Orillia.

The Town of Barrie

IS situated at the head of Kempenfeldt Bay Lake Simcoe in shape resembling a horseshoe It is the County Town of Simcoe Province of Ontario and has the County Municipal Buildings and Law Courts BARRIE is on the main line of the Northern Division of the Grand Trunk Railway 62 miles north of Toronto and is the divisional point of five branches of the G T R BARRIE has a service of 16 trains arriving and leaving daily and a continuous heavy freight traffic BARRIE owns and operates its own Electric Light Plant The price of light per 1000 Watts is 9 cents An all day service for power purposes at low rates will be quoted to applicants

BARRIE'S population is 6 850

BARRIE owns and operates its own Waterworks System which is managed by a Commission The supply from Artesian wells is inexhaustible and is absolutely pure in fact the purest on the Continent being 8 pts cent above par by analysis The capacity per day of six hours is 2 000 000 gallons fire pressure 180 lbs domestic pressure 80 lbs The price for single tap flat rate is $3 00 per annum The price for 1000 gals by meter to 22 users domestic

BARRIE has 25 miles of cement sidewalks and splendid roads

BARRIE has 6 Banks 10 Hotels Local and Long Distance Telephones, 4 Printing and Newspapers Offices, 12 Churches Armouries Theatre Public Library Y M C A Gas Plant and a 52-roomed Hospital

BARRIE has an excellent sewerage system and is a very healthy town to live in Hay fever is entirely unknown

BARRIE is beautifully situated and has natural scenery in abundance Is the mecca for tourists and often termed The Venice of America Kempenfeldt Bay affords good boating fishing and bathing

BARRIE is the home of the Barrie Tannery Barrie Carriage Works Canada Producer and Gas Engine Co Barrie Planing Mill The Ball Planing Mill Co and other industries

BARRIE has many advantages for manufacturers of Woodenware Knitting Mills Tanneries Shoe Factories, Wool Factories, etc and has a number of excellent factory sites at a very low figure

BARRIE has plenty of labour both skilled and unskilled

BARRIE is surrounded by a magnificent farming country and has a good market for live stock produce grain etc

BARRIE'S boat service connecting with Orillia and other towns and resorts on Lake Simcoe is good and improving yearly and is greatly appreciated by summer tourists It has within a few miles unlimited lake shore front suitable for summer cottages and summer residences

BARRIE Citizens Band is a first class organization and gives free concerts weekly throughout the summer months

ORGANIZATIONS AND SOCIETIES.—Barrie Bowling and Tennis Club Barrie Horticultural and Town Improvement Society Barrie Aquatic Club

BARRIE SPORTS —Swimming Boating Fishing Bowling, Tennis Golf Ball Lacrosse Driving Motoring, etc

Fenelon Falls, Ontario

TO the thousands of campers tourists owners of power yachts from both Canada and the United States who annually spend their summer vacation on the beautiful chain of lakes between Balsam and Cameron Lakes, constituting the Trent Canal no summer resort is more favorably known than Fenelon Falls Ont This charmingly situated little town is practically a key to one of the most beautiful sections of the Kawartha Lakes To the tourist who depends upon his canoe or paddle to convey himself and his summer outfit from point to point no more admirably situated and picturesque location could be selected The everlasting roar of falling water soothes the nerves of the man who in town or city has his nerves upset by the strenuous competition of modern life The Fenelon River placidly flowing past the hotel at which he may stop with its tree-crowned banks, where vegetation seems to defy nature by springing from cranks and crevices in the massive granite teems with game fish In the shadow of the granite banks lurk muskanonge and black bass only waiting for the spoon of the troller or the bait of the still fisherman Within a few hundred feet of the admirably conducted and well provided hotels of Fenelon Falls is one of the best fishing grounds in all waters may be so described to be found in our grand Dominion Fenelon Falls can boast of having some of the finest and best managed hotels in Ontario

The drinking water of Fenelon Falls is exceptionally pure and good From Fenelon Falls the owners of gasoline and steam launches can readily ply to all parts of the Trent Canal system The summer visitor thus has magnificent boating, fishing and bathing within a few feet of his hotel The public steamboat service is unsurpassed Fenelon Falls is within easy reach of Lindsay Peterboro and Toronto by rail

Manufacturers seeking locations where cheap power and transportation are a material factor should keep Fenelon Falls in mind Electric power is here to be had for $10 00 per horse power The Town Council and Board of Trade of Fenelon Falls, both active and progressive municipal bodies offer desirable locating manufacturers free building sites and exemption from taxation should such locating factories employ a reasonable number of hands Full information along such lines will be fully freely and cheerfully supplied on application by the Secretary of the Board of Trade Fenelon Falls Ont Fenelon Falls is *THE* place to spend your summer vacation If you want Health Happiness, Good Bathing Good Boating and Good Bass Fishing,

The Electric City—Peterborough

MOST interesting point on the Trent Waterway is the City of Peterborough with a population of 18 000. It is the only City on the Waterway and is one of the most prosperous, progressive and attractive places in the Dominion. The growth of the City especially in the last few years, has been rapid owing to the industrial development that has taken place and its attractiveness and beauty it has kept pace with its expansion and increase of population. The basis of the growth of Peterborough is the fact that it has all the essentials and accessories for manufacturing and distributing and in this respect it has advantages that are not excelled anywhere. The essentials for a manufacturing centre are:

Cheap electric power and plenty of it
Shipping facilities for reaching all markets.
Suitable sites for industries
And good labour conditions

Of Electric power, developed from the water powers on the Otonabee River and other waters Peterborough has an abundant supply. Several of these power sites have been developed and others are being developed and as fast as it may be called for 30 000 horse power of hydro-electric power can be supplied. This abundant supply of power is furnished delivered to the mills for power purposes at very low rates—so low as to be most attractive to manufacturers.

The shipping facilities are unexcelled. The City is situated between the two commercial centres, Montreal and Toronto and is on the line from the Georgian Bay (which means the Northwest) to the seaboard and is in a central location for reaching all the best markets. It has both the Canadian Pacific and Grand Trunk Railways. The Grand Trunk branches out in four different directions from the city and besides being on the main line of the Canadian Pacific Railway between Montreal and Toronto, it is also on the Canadian Pacific line to the Georgian Bay. It has thus direct connection with all parts of the Dominion. The Trent Waterway also gives water communication as is described in this publication.

The number and diversity of the industries in Peterborough makes labour of all kinds easily obtainable and labour troubles are unknown. The workmen are largely home-owners and interested in the welfare of the city. Owing to expenses being lower than in the larger centres the cost of labour is lower which is a great advantage to the manufacturer.

Possessing these essentials for manufacturing and distributing Peterborough also has excellent systems of sewers and waterworks, electric street railway, several large and fine parks, handsome churches and public buildings, a number of well equipped public schools, Collegiate Institute and Provincial Normal School, first class mercantile establishments, three hospitals, theatres, a low rate of taxes, most efficient fire protection—all the conditions for business, health, comfort and pleasure.

The summer resorts adjacent to Peterborough are celebrated ones including Stony Lake with its picturesque Islands, Chemong Lake with its beautiful park and the Otonabee River and Rice Lake with their numerous attractive resorts.

These advantages of situation given by nature and the acquired advantages that have been secured and built up combined with the public spirit of the citizens have resulted in Peterborough passing all the other towns in the district as the race for advancement. Its manufacturing industries are numerous including The Canadian General Electric Company's works in which about 2000 employees are engaged. The Quaker Oats Mills. The Brieton Carpet Factory whose parent industry is in England and woollen mills, lock factory, tool factories, makers of mill, mining and hydraulic machinery, agricultural implements, locks and builders' hardware, harness and saddlery, stoves, boats of all kinds, mills and mills, rope and cordage, gasoline engines, lumber, brush furniture, cereal products, steam engines and pumps, show cases, mattresses, pork products, and many other lines. Altogether there is $12 180 000 of capital invested in manufacturing in Peterborough and the annual production of the industries aggregates $42,000 000. Frequent enlargements are emphatic evidences of the prosperity of the industries. Wholesale houses of which there are several, mainly in the city's advantages as a distributing centre.

The many superior advantages of Peterborough are open to new industries and enquiries will be willingly answered and information cheerfully given and every effort will be made to facilitate their establishment. For additional intelligence on any points or for specific information bearing on any line of manufacture, write to the City Clerk and prompt attention will be given.

Trenton

BESIDES being the southern outlet of the Trent Canal, Trenton is conspicuous for its many natural advantages. For many years the citizens of Trenton have looked forward to the development of the water power on the Trent River. In a small way the Trenton Electric and Water Company have for a number of years developed a limited quantity of power at the Town timber dam, while the Gilmour Door Company also developed sufficient power at the same dam for their own use.

During the last couple of years the Electric Power Company has secured the practical control of all the powers on the River from Healey Falls to Trenton, and it is estimated that their total development will exceed 100,000 horse power. This Company, with its network of transmission wires has covered the Central Ontario district thoroughly and has acquired many of the local lighting and power plants in the towns and villages between Oshawa and Kingston.

Last January an excellent Council was elected, and as a result of their efforts and with the assistance of an energetic Board of Trade, Trenton has advanced faster commercially than ever before. The Council and Board of Trade of 1911 will long be remembered as having assisted most materially in bringing Trenton's advantages before the people of Canada and the United States.

Cheap power has, of course, been the magnet which has attracted many of the new industries to Trenton. Power at $15.00 per H. P. twenty-four hours service delivered at the customer's terminals, is certainly a drawing card. The Town of Trenton has at this rate 1000 H. P. to dispose of, having in return for a lease of its power rights at Dam 1 and 2 to the Electric Power Company, accepted this amount of power as part of the settlement. The Trenton Electric and Water Company has now available for Trenton users 10,000 horse power and upon the completion of Dam No. 2 will have to dispose of 20,000 H.P.

Of all the towns along the Canal, Trenton promises the greatest development, because it has the added advantage of being on the deep waters of Lake Ontario and being served by main railways than any other town in Ontario. Trenton can offer great facilities for shipping by rail. It is the junction of the Grand Trunk and the Central Ontario Railways. This latter road is part of the Canadian Northern Ontario System, lately acquired and Canadian Northern trains will be running through Trenton in July of this year. The Canadian Pacific lake shore line, now being surveyed between Toronto and Montreal will run through Trenton. The proposed electric road between Toronto and Montreal will also traverse Trenton.

With easy access via the Murray Canal to Lake Ontario, Trenton has superior advantages as a distributing centre by water. The Richelieu & Ontario Navigation Company's Steamer "Belleville" calls regularly twice each week when on her run between Toronto and Montreal, while the large and handsome steamer of the Ontario & Quebec Navigation Company "Alexandria" running between Rochester and Quebec makes the same number of calls at Trenton. The Corsican, the handsome new boat just launched at Collingwood, will also ply on this route. The steamers Verona and Brockville make daily trips between Trenton and Picton calling at Belleville and Deseronto. In addition to the passenger and package freight business catered to by these boats, many large freighters call at Trenton carrying chiefly coal cargoes.

In addition to being a manufacturing town of importance Trenton is fast coming under the notice of the people of Canada as a tourist centre. Where can you find a more beautiful spot for the summer campers and cottagers than the shores which skirt the Trenton harbour? The land locked water stretch is always comparatively calm. The turbulent waves from the lake do not ruffle its surface. How many would avoid the fatiguing crush of an Atlantic watering place if this ideal existence were brought to their notice with one tenth the persistency which the United States displays in keeping their places before the public. If the other transportation companies who are equally interested in this district would do as much to make its advantages known as the Ontario & Quebec Navigation Company has done, many more would come here every year.

It is fully expected that in less than two years it will be possible for small boats to ascend the Canal as far as Washago on Lake Couchiching, above Orillia. To anyone acquainted with the beautiful scenery along the banks of the River Trent the prospect of taking this trip in a comfortable motor boat will be most inviting. Probably the finest black bass and pickerel fish lying in Ontario is to be had in the waters of the Bay of Quinte and the River Trent.

Sports of every kind having in view the physical development of the young men of the town are freely indulged in and encouraged liberally. The boys and girls who grow up in Trenton will always look back to the days of their childhood with intense pleasure. No inland town for them!

Electric Motive Power for Eastern and Central Ontario

THE most pronounced feature co incident with the opening up of the Trent Valley Canal and closely allied with its engineering aspects, is apparent in the recent rapid development of the abundant water powers of the basin which the Canal traverses for three fourths of its length. Rising in the remotest parts of the Highlands of Ontario the Trent waters are collected by half a dozen important tributaries and poured turbulently into the long chain of Kawartha Lakes, covering approximately an area of 75 000 acres, and whose mean elevation above Lake Ontario is 550 feet

From this huge reservoir the water drops in a succession of falls varying from 10 to 75 ft in height and scattered uniformly along the river's course to its outlet at Trenton

From these water falls about 100 000 H P is being made available on water wheel shafts and 75 000 H P delivered in the industrial centres as electric energy

The economical generation control and distribution to points of demand of this very large quantity of power by the various original individual proprietary interests was manifestly impossible As a consequence the exigencies of the situation evolved a single comprehensive system whose modern and standardized hydro-electric stations dot the map from Burleigh Falls to Trenton

Connecting and radiating from the generating centres a net work of carefully planned transmission lines covers the whole of Central Ontario from Peterborough at the north to Kingston on the east and Wh dby on the west over which the power is distributed

This organization of power interests is known as THE ELECTRIC POWER COMPANY LIMITED with head offices in Toronto Its power distribution system is almost completed and not only is every manufacturing centre in the Trent district benefiting by the cheap and abundant power thus brought to its doors but there are few villages and rural centres which as yet remain to assist electric light and modern electrical conveniences Thus organization is furthermore giving the application of electricity to agricultural purposes its close study with a view of still further enlarging the scope of its market and making Central Ontario the most modern and well developed community both industrially and agriculturally in Canada

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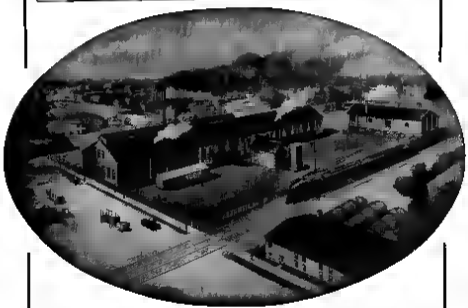

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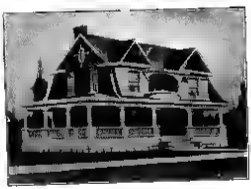

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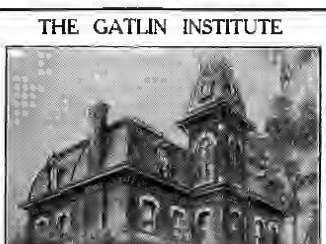

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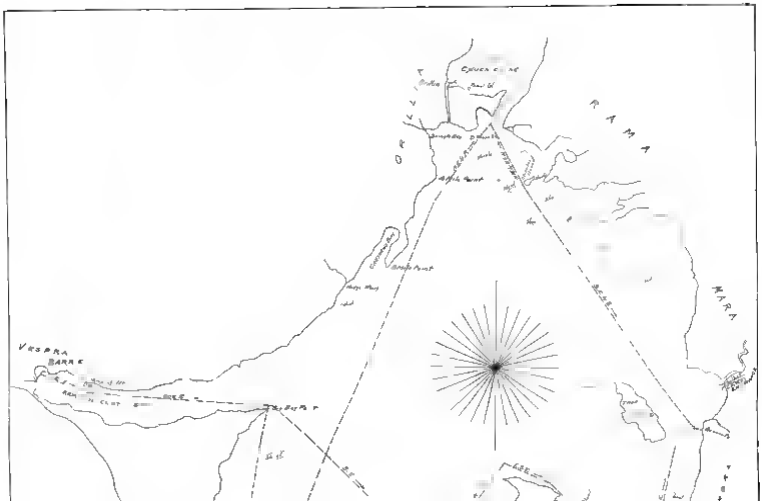
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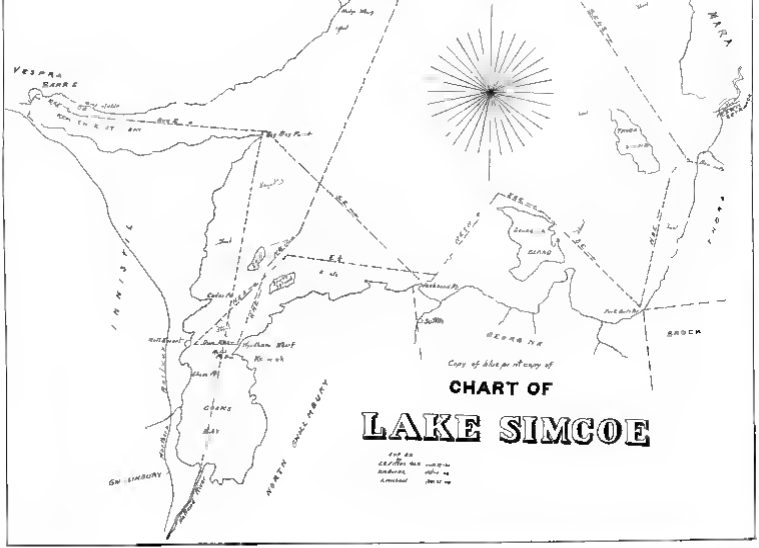
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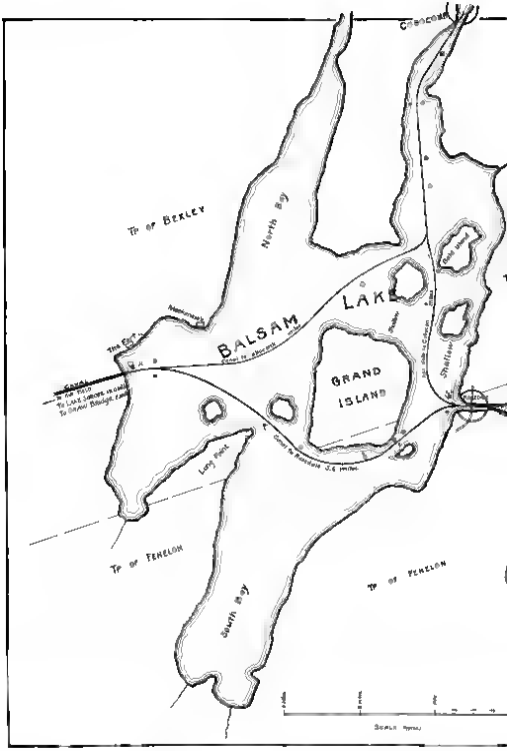
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Long Point
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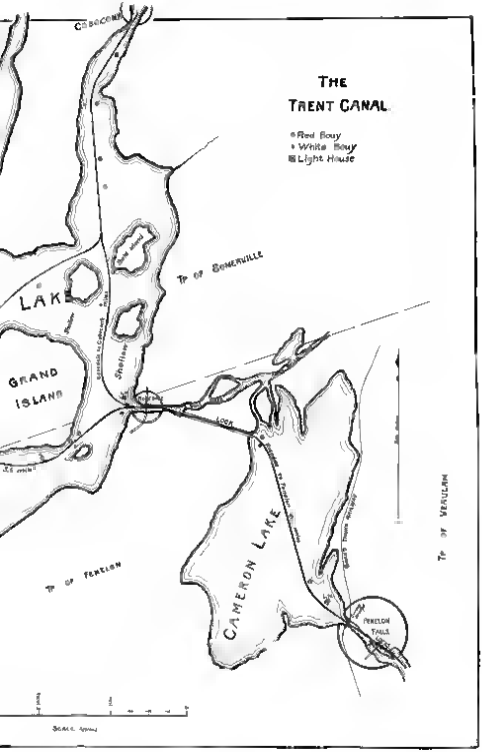
South Bay
Twp of FERELON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Red Buoy
White Buoy
Light House
LAKE
GRAND
ISLAND
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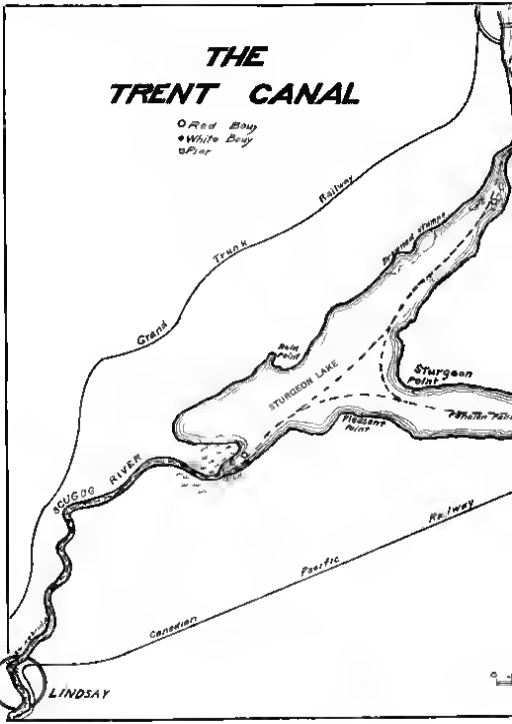
Tp OF FENELON
Tp OF VERULAM
CAMERON LAKE
FENELON
FALLS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Grand Trunk Railway
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Sturgeon Point
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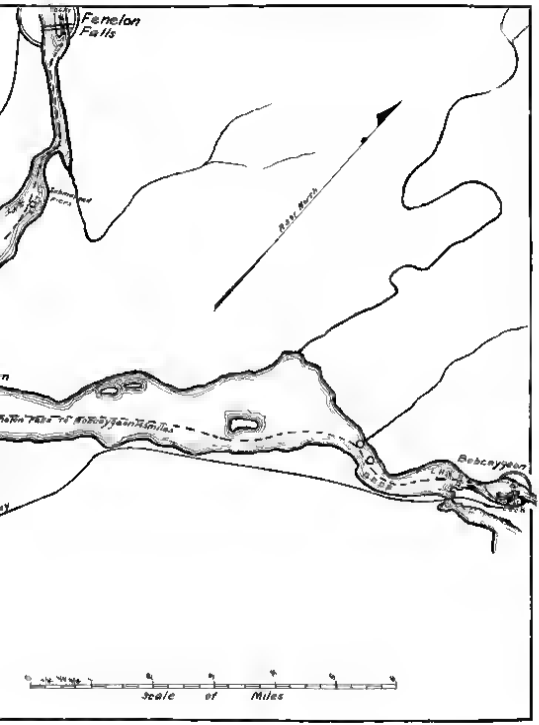
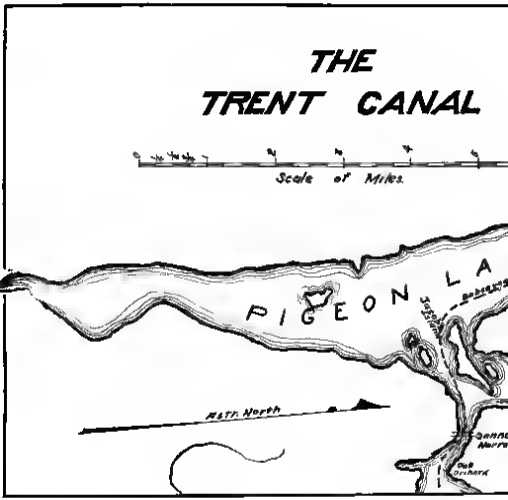

Fenelon Falls
Rice Bay
Bobcaygeon
Scale of Miles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Scale of Miles.
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Marra
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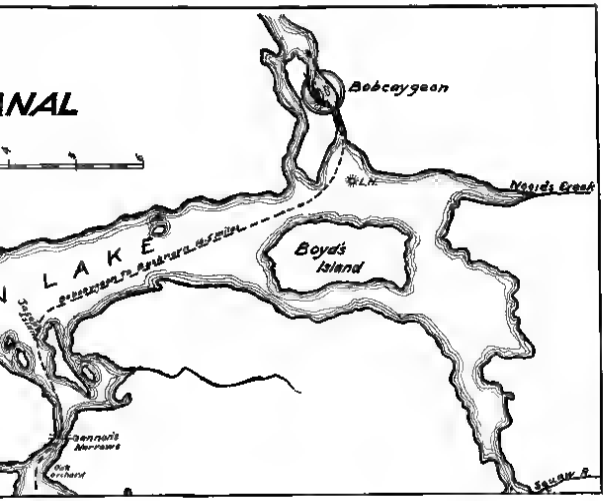
Orchard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Boyd's Island
Boyd's Creek
L A K E
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Oak Orchard
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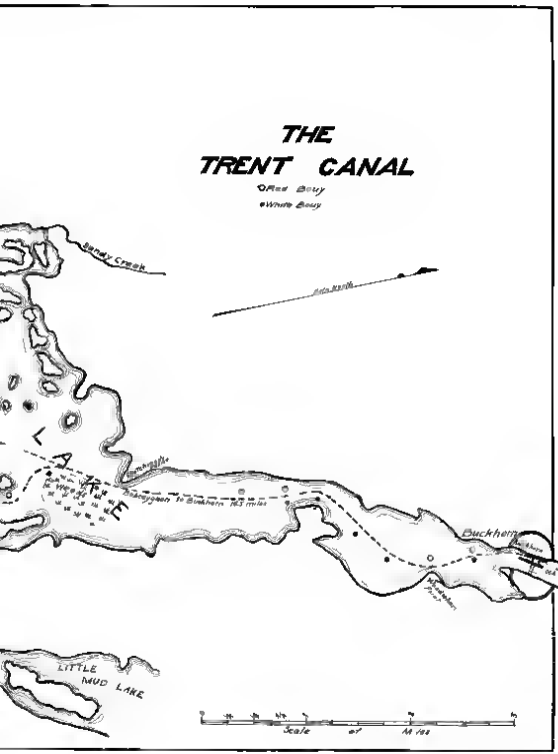
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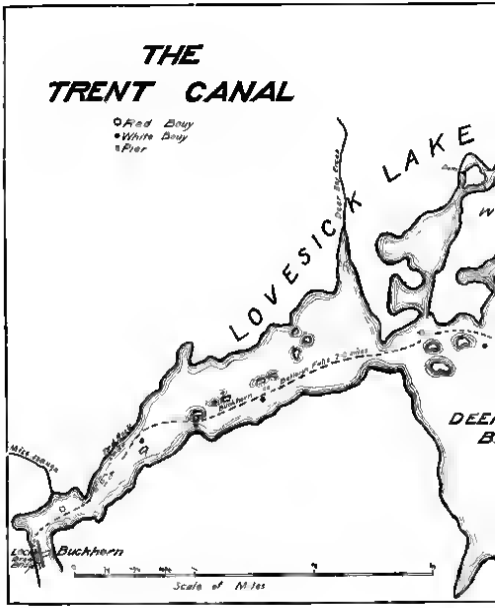
White Buoy
Bailey Creek
L A K E
Buckhorn
LITTLE
MUD LAKE
Scale of Miles


THE
TRENT CANAL
Red Buoy
White Buoy
Pier
LOVESICK LAKE
Buckhorn
Scale of Miles

Bushleigh Falls
LAKE
Wolf
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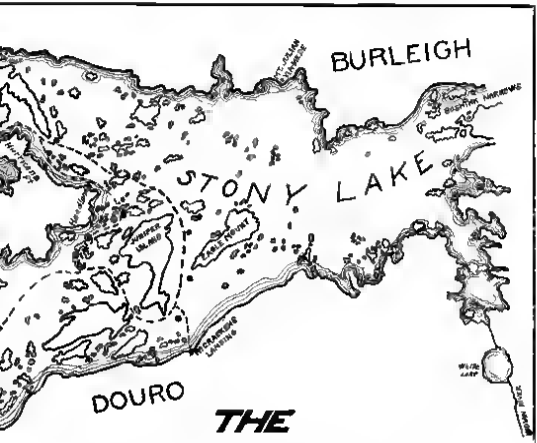
Lovelock
DEER
BAY

SMITH
CLEAR LAKE
Young's Point
South Beach
Sandy Beach
Sandy Pt.
DUNLAP ROAD



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*Red Buoy
*White Buoy
*Light House

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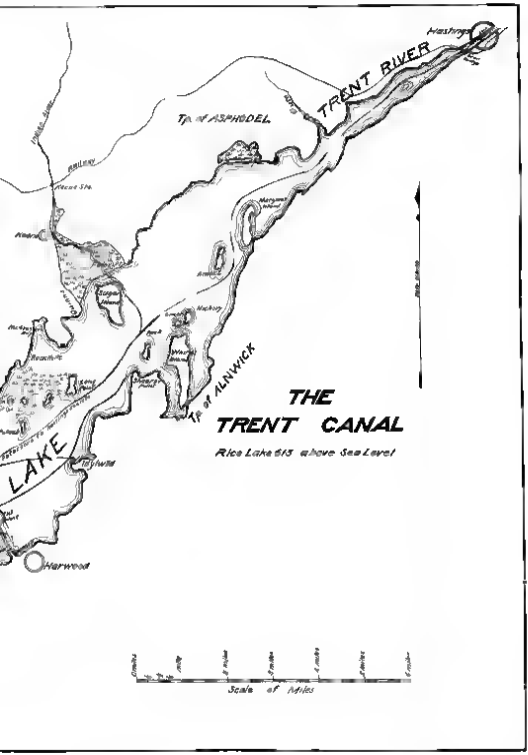
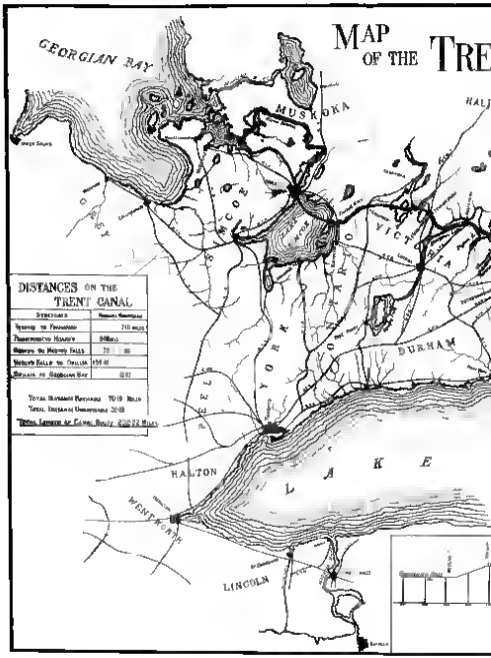
OTONABEE RIVER
Tp. of Otonabee
Tp. of MONAGHAN
Tp. of HAMILTON
Hiawatha
Harwood
Curds Landing
RICE
LAKE


TRENT RIVER
Twp of ASPHODEL
Twp of ALNWICK
THE
TRENT CANAL
Rice Lake 613 above Sea Level
LAKE
Harwood
Scale of Miles


MAP OF THE TRE
GEORGIAN BAY
MUSKOKA
DISTANCES ON THE TRENT CANAL
LAKE
HALTON
WENTWORTH
LINCOLN
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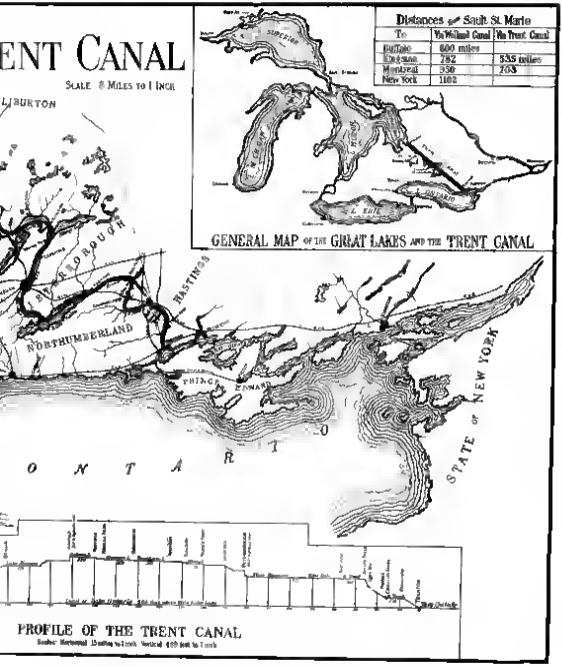
YORK


ENT CANAL
SCALE 8 MILES TO 1 INCH
LIBURTON
PETERBOROUGH
NORTHUMBERLAND
HASTINGS
PRINCE EDWARD
ONTARIO
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Distances from Sault St. Marie
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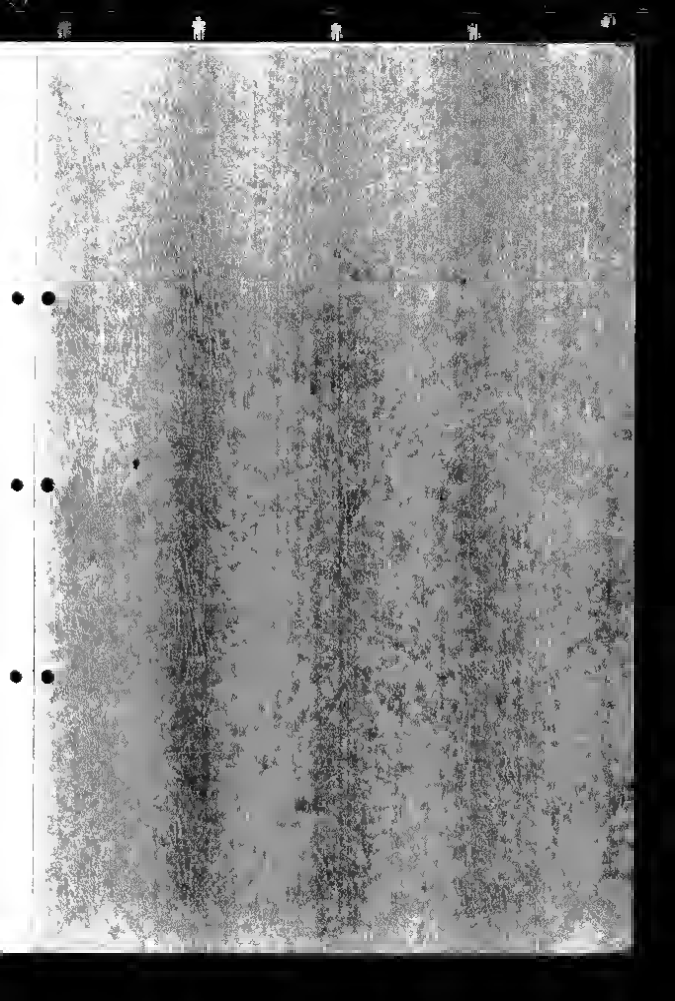

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Leader Humor as an Interpersonal Resource: Integrating Three Theoretical Perspectives

Nicholas A. Kuiper
University of Western Ontario

Rod A. Martin
University of Western Ontario

Abstract

Three theoretical perspectives on leader humor are integrated and tested in a sample of 1,129 employees. Leader humor was hypothesized to be positively related to leader–member exchange (LMX) quality, and this relationship was hypothesized to be mediated by perceived leader competence, perceived leader warmth, and perceived leader dominance. Leader humor was also hypothesized to moderate the relationship between perceived leader competence and LMX quality. Results supported the hypothesized mediation model and moderation effect. Implications for theory and practice are discussed.

Keywords: humor, leadership, leader–member exchange, interpersonal perception, social cognition

Humor is a ubiquitous feature of human interaction, and it is widely believed that humor is important in leadership. Indeed, humor is frequently mentioned in popular books on leadership (e.g., Bell & Smith, 2010; Gardner, 2007; Kouzes & Posner, 2007; Maxwell, 2007; Peters & Austin, 1985; Ulrich, Zenger, & Smallwood, 1999; Wooden & Jamison, 2007), and leaders themselves often report that humor is important in their leadership style (Decker & Rotondo, 1999; Holmes & Marra, 2006; Romero & Pescosolido, 2008). Despite the widespread belief that humor is important in leadership, there is surprisingly little empirical research on the topic. Most of the research that has been conducted has focused on the relationship between leader humor and leadership effectiveness (e.g., Avolio, Howell, & Sosik, 1999; Cooper, Kong-Ming Chye, Waldman, Overland, Orrego, & Yayla-Kullu, 2008; Decker & Rotondo, 1999; Goodboy & Myers, 2008; Holmes & Marra, 2006; Romero & Pescosolido, 2008; Sosik, Kahai, & Avolio, 1998; Wanzer, Booth-Butterfield, & Booth-Butterfield, 1996; Wanzer, Booth-Butterfield, & Gruber, 2004). Although this research has yielded some important findings, it has been largely atheoretical and has failed to address the mechanisms underlying the relationship between leader humor and leadership effectiveness. The purpose of the present study was to integrate three theoretical perspectives on leader humor and to test a model of the relationship between leader humor and leadership effectiveness.

Theoretical Perspectives on Leader Humor

Humor as a Leadership Style

Humor is a multifaceted phenomenon that can be studied as a trait, a state, a cognitive process, a social process, a physiological process, a stimulus, a response, or a product (Martin, 2007). Humor can be used in many different ways and for many different purposes. Martin, Puhlik-Doris, Larsen, Gray, and Weir (2003) developed a model of humor styles that distinguishes between four different styles of humor. Two of these styles are adaptive, and two are maladaptive. The adaptive styles are affiliative humor and self-enhancing humor. Affiliative humor is the tendency to use humor to enhance one's relationships with others, such as by telling jokes or funny stories, saying amusing things, or behaving playfully. Self-enhancing humor is the tendency to maintain a humorous outlook on life, even when one is not with other people, and to use humor to cope with stress and adversity. The maladaptive styles are aggressive humor and self-defeating humor. Aggressive humor is the tendency to use sarcasm, ridicule, derogatory humor, or criticism to control others. Self-defeating humor is the tendency to disparage oneself excessively to amuse others, to say embarrassing things about oneself, or to laugh along when others are laughing at one's expense.

Martin et al. (2003) developed the Humor Styles Questionnaire (HSQ) to measure these four humor styles. Research using the HSQ has found that affiliative humor is positively related to extraversion, agreeableness, and openness to experience; self-enhancing humor is positively related to extraversion and openness to experience and negatively related to neuroticism; aggressive humor is positively related to extraversion and psychoticism and negatively related to agreeableness and conscientiousness; and self-defeating humor is positively related to neuroticism and negatively related to extraversion, agreeableness, and conscientiousness (Martin et al., 2003; Vernon, Martin, Schermer, & Mackie, 2008). Research has also found that affiliative humor is positively related to self-esteem, social support, and life satisfaction; self-enhancing humor is positively related to self-esteem and life satisfaction and negatively related to depression; aggressive humor is negatively related to self-esteem, social support, and life satisfaction; and self-defeating humor is positively related to depression and negatively related to self-esteem, social support, and life satisfaction (Martin et al., 2003; Saroglou & Scariot, 2002).

Martin et al.'s (2003) model of humor styles has been applied to the study of leadership by Kuiper, Grimshaw, Leslie, and Kirschenbaum (2004). Kuiper et al. (2004) argued that leaders who use affiliative humor and self-enhancing humor will be perceived as more effective leaders than leaders who use aggressive humor and self-defeating humor. Kuiper et al. (2004) found that leaders who used affiliative humor and self-enhancing humor were perceived as more effective leaders than leaders who used aggressive humor and self-defeating humor. Kuiper et al. (2004) also found that leaders who used affiliative humor and self-enhancing humor were perceived as more likable than leaders who used aggressive humor and self-defeating humor. Kuiper et al. (2004) argued that leaders who use affiliative humor and self-enhancing humor will be perceived as more likable because they are perceived as more warm and approachable. Kuiper et al. (2004) also argued that leaders who use affiliative humor and self-enhancing humor will be perceived as more effective because they are perceived as more competent and confident.

Humor as a Social Skill

Humor can be viewed as a social skill that is important in leadership. Social skill is the ability to effectively manage one's interactions with others (Riggio, 1986). Riggio (1986) developed a model of social skill that distinguishes between six different social skills. Two of these skills are emotional skills, two are social skills, and two are control skills. The emotional skills are emotional expressivity and emotional sensitivity. Emotional expressivity is the ability to express one's emotions to others. Emotional sensitivity is the ability to understand the emotions of others. The social skills are social expressivity and social sensitivity. Social expressivity is the ability to initiate and maintain social interactions. Social sensitivity is the ability to understand the social norms and roles that govern social interactions. The control skills are emotional control and social control. Emotional control is the ability to regulate one's emotions. Social control is the ability to regulate one's social behavior.

Riggio (1986) developed the Social Skills Inventory (SSI) to measure these six social skills. Research using the SSI has found that emotional expressivity is positively related to extraversion and agreeableness; emotional sensitivity is positively related to agreeableness; social expressivity is positively related to extraversion; social sensitivity is positively related to agreeableness; emotional control is positively related to agreeableness and conscientiousness and negatively related to neuroticism; and social control is positively related to extraversion and conscientiousness (Riggio, 1986; Riggio & Carney, 2003). Research has also found that emotional expressivity is positively related to self-esteem and life satisfaction; emotional sensitivity is positively related to self-esteem, social support, and life satisfaction; social expressivity is positively related to self-esteem and life satisfaction; social sensitivity is positively related to self-esteem, social support, and life satisfaction; emotional control is positively related to self-esteem, social support, and life satisfaction and negatively related to depression; and social control is positively related to self-esteem and life satisfaction (Riggio, 1986; Riggio & Carney, 2003).

Riggio's (1986) model of social skill has been applied to the study of leadership by Riggio, Riggio, Salinas, and Cole (2003). Riggio et al. (2003) argued that leaders who are high in social skill will be perceived as more effective leaders than leaders who are low in social skill. Riggio et al. (2003) found that leaders who were high in social skill were perceived as more effective leaders than leaders who were low in social skill. Riggio et al. (2003) also found that leaders who were high in social skill were perceived as more likable than leaders who were low in social skill. Riggio et al. (2003) argued that leaders who are high in social skill will be perceived as more likable because they are perceived as more warm and approachable. Riggio et al. (2003) also argued that leaders who are high in social skill will be perceived as more effective because they are perceived as more competent and confident.

Humor as a Form of Impression Management

Humor can be viewed as a form of impression management that is important in leadership. Impression management is the process by which people attempt to control the impressions that others form of them (Leary & Kowalski, 1990). Leary and Kowalski (1990) developed a model of impression management that distinguishes between two different components of impression management. These components are impression motivation and impression construction. Impression motivation is the motivation to control the impressions that others form of oneself. Impression construction is the process by which people decide what impressions they want to convey to others and how they will convey those impressions.

Leary and Kowalski (1990) developed the Impression Management Scale (IMS) to measure these two components of impression management. Research using the IMS has found that impression motivation is positively related to extraversion and agreeableness and negatively related to neuroticism; impression construction is positively related to extraversion and conscientiousness and negatively related to neuroticism (Leary & Kowalski, 1990; Paulhus & Trapnell, 2008). Research has also found that impression motivation is positively related to self-esteem and life satisfaction and negatively related to depression; impression construction is positively related to self-esteem and life satisfaction and negatively related to depression (Leary & Kowalski, 1990; Paulhus & Trapnell, 2008).

Leary and Kowalski's (1990) model of impression management has been applied to the study of leadership by Kuiper et al. (2004). Kuiper et al. (2004) argued that leaders who use humor to control the impressions that others form of them will be perceived as more effective leaders than leaders who do not use humor to control the impressions that others form of them. Kuiper et al. (2004) found that leaders who used humor to control the impressions that others form of them were perceived as more effective leaders than leaders who did not use humor to control the impressions that others form of them. Kuiper et al. (2004) also found that leaders who used humor to control the impressions that others form of them were perceived as more likable than leaders who did not use humor to control the impressions that others form of them. Kuiper et al. (2004) argued that leaders who use humor to control the impressions that others form of them will be perceived as more likable because they are perceived as more warm and approachable. Kuiper et al. (2004) also argued that leaders who use humor to control the impressions that others form of them will be perceived as more effective because they are perceived as more competent and confident.

Integrating Three Theoretical Perspectives on Leader Humor

Three theoretical perspectives on leader humor have been described: humor as a leadership style, humor as a social skill, and humor as a form of impression management. These three perspectives are not mutually exclusive. Rather, they are complementary and can be integrated into a single model of leader humor. The present study integrated these three perspectives and tested a model of the relationship between leader humor and leadership effectiveness.

Leader Humor and Leader–Member Exchange Quality

Leader–member exchange (LMX) theory is a theory of leadership that focuses on the relationship between leaders and their followers (Graen & Uhl-Bien, 1995). LMX theory argues that leaders develop different relationships with different followers and that the quality of these relationships is important in leadership. LMX theory argues that leaders who have high-quality relationships with their followers will be more effective leaders than leaders who have low-quality relationships with their followers. LMX theory also argues that followers who have high-quality relationships with their leaders will be more satisfied with their jobs and more committed to their organizations than followers who have low-quality relationships with their leaders.

LMX theory has been applied to the study of humor by Kuiper et al. (2004). Kuiper et al. (2004) argued that leaders who use humor will have higher-quality relationships with their followers than leaders who do not use humor. Kuiper et al. (2004) found that leaders who used humor had higher-quality relationships with their followers than leaders who did not use humor. Kuiper et al. (2004) also found that leaders who used humor were perceived as more effective leaders than leaders who did not use humor. Kuiper et al. (2004) argued that leaders who use humor will be perceived as more effective because they have higher-quality relationships with their followers.

Leader Humor and Perceived Leader Competence

Perceived leader competence is the extent to which a leader is perceived as competent, confident, and effective. Perceived leader competence is an important factor in leadership because leaders who are perceived as competent, confident, and effective are more likely to be trusted and followed than leaders who are not perceived as competent, confident, and effective. Perceived leader competence is also an important factor in leadership because leaders who are perceived as competent, confident, and effective are more likely to have high-quality relationships with their followers than leaders who are not perceived as competent, confident, and effective.

Leader humor is hypothesized to be positively related to perceived leader competence. Leaders who use humor are hypothesized to be perceived as more competent, confident, and effective than leaders who do not use humor. This hypothesis is based on the theoretical perspectives described above. Humor as a leadership style, humor as a social skill, and humor as a form of impression management all argue that leaders who use humor will be perceived as more competent, confident, and effective than leaders who do not use humor.

Leader Humor and Perceived Leader Warmth

Perceived leader warmth is the extent to which a leader is perceived as warm, approachable, and likable. Perceived leader warmth is an important factor in leadership because leaders who are perceived as warm, approachable, and likable are more likely to be trusted and followed than leaders who are not perceived as warm, approachable, and likable. Perceived leader warmth is also an important factor in leadership because leaders who are perceived as warm, approachable, and likable are more likely to have high-quality relationships with their followers than leaders who are not perceived as warm, approachable, and likable.

Leader humor is hypothesized to be positively related to perceived leader warmth. Leaders who use humor are hypothesized to be perceived as more warm, approachable, and likable than leaders who do not use humor. This hypothesis is based on the theoretical perspectives described above. Humor as a leadership style, humor as a social skill, and humor as a form of impression management all argue that leaders who use humor will be perceived as more warm, approachable, and likable than leaders who do not use humor.

Leader Humor and Perceived Leader Dominance

Perceived leader dominance is the extent to which a leader is perceived as dominant, assertive, and powerful. Perceived leader dominance is an important factor in leadership because leaders who are perceived as dominant, assertive, and powerful are more likely to be trusted and followed than leaders who are not perceived as dominant, assertive, and powerful. Perceived leader dominance is also an important factor in leadership because leaders who are perceived as dominant, assertive, and powerful are more likely to have high-quality relationships with their followers than leaders who are not perceived as dominant, assertive, and powerful.

Leader humor is hypothesized to be positively related to perceived leader dominance. Leaders who use humor are hypothesized to be perceived as more dominant, assertive, and powerful than leaders who do not use humor. This hypothesis is based on the theoretical perspectives described above. Humor as a leadership style, humor as a social skill, and humor as a form of impression management all argue that leaders who use humor will be perceived as more dominant, assertive, and powerful than leaders who do not use humor.

Leader Humor and Leader–Member Exchange Quality: Mediation

Leader humor is hypothesized to be positively related to LMX quality. This hypothesis is based on the theoretical perspectives described above. Humor as a leadership style, humor as a social skill, and humor as a form of impression management all argue that leaders who use humor will have higher-quality relationships with their followers than leaders who do not use humor.

Perceived leader competence, perceived leader warmth, and perceived leader dominance are hypothesized to mediate the relationship between leader humor and LMX quality. This hypothesis is based on the theoretical perspectives described above. Humor as a leadership style, humor as a social skill, and humor as a form of impression management all argue that leaders who use humor will be perceived as more competent, confident, and effective; more warm, approachable, and likable; and more dominant, assertive, and powerful than leaders who do not use humor. These perceptions are hypothesized to mediate the relationship between leader humor and LMX quality.

Leader Humor and Leader–Member Exchange Quality: Moderation

Leader humor is hypothesized to moderate the relationship between perceived leader competence and LMX quality. This hypothesis is based on the theoretical perspectives described above. Humor as a leadership style, humor as a social skill, and humor as a form of impression management all argue that leaders who use humor will be perceived as more competent, confident, and effective than leaders who do not use humor. These perceptions are hypothesized to mediate the relationship between leader humor and LMX quality. However, these perceptions are also hypothesized to moderate the relationship between leader humor and LMX quality.

Leaders who use humor are hypothesized to be perceived as more competent, confident, and effective than leaders who do not use humor. These perceptions are hypothesized to mediate the relationship between leader humor and LMX quality. However, these perceptions are also hypothesized to moderate the relationship between leader humor and LMX quality. Leaders who use humor are hypothesized to be perceived as more competent, confident, and effective than leaders who do not use humor. These perceptions are hypothesized to mediate the relationship between leader humor and LMX quality. However, these perceptions are also hypothesized to moderate the relationship between leader humor and LMX quality.

Method

Participants

Participants were 1,129 employees from a variety of organizations in the United States. The sample was 60% female and 40% male. The mean age of the sample was 35.2 years (SD = 10.5 years). The sample was 70% White, 15% African American, 10% Asian American, and 5% other. The sample was 60% married, 30% single, and 10% other. The sample was 50% college graduates, 30% high school graduates, and 20% other. The sample was 50% full-time employees, 30% part-time employees, and 20% other. The sample was 50% supervisors, 30% managers, and 20% other.

Procedure

Participants were recruited through a variety of methods, including advertisements in newspapers, flyers posted in public places, and announcements in classes. Participants were told that the study was about leadership and humor. Participants were told that they would be asked to complete a questionnaire about their leader's humor and leadership style. Participants were told that their responses would be confidential and that they would not be identified by name.

Participants completed the questionnaire in a variety of settings, including their homes, their workplaces, and public places. Participants were told that they could complete the questionnaire at their own pace and that they could take as much time as they needed. Participants were told that they could withdraw from the study at any time without penalty.

Measures

Leader Humor

Leader humor was measured using the Leader Humor Scale (LHS). The LHS is a 10-item scale that measures the extent to which a leader uses humor in his or her leadership style. The LHS includes items such as "My leader uses humor to motivate me," "My leader uses humor to build rapport with me," and "My leader uses humor to reduce tension in the workplace." Participants rated their leader's humor on a 7-point scale ranging from 1 (strongly disagree) to 7 (strongly agree). The LHS had a Cronbach's alpha of .92 in the present sample.

Leader–Member Exchange Quality

LMX quality was measured using the LMX-7 scale (Graen & Uhl-Bien, 1995). The LMX-7 is a 7-item scale that measures the quality of the relationship between a leader and his or her follower. The LMX-7 includes items such as "How well does your leader understand your job problems and needs?" and "How well does your leader recognize your potential?" Participants rated the quality of their relationship with their leader on a 5-point scale ranging from 1 (not at all) to 5 (extremely). The LMX-7 had a Cronbach's alpha of .89 in the present sample.

Perceived Leader Competence

Perceived leader competence was measured using the Perceived Leader Competence Scale (PLCS). The PLCS is a 10-item scale that measures the extent to which a leader is perceived as competent, confident, and effective. The PLCS includes items such as "My leader is competent," "My leader is confident," and "My leader is effective." Participants rated their leader's competence on a 7-point scale ranging from 1 (strongly disagree) to 7 (strongly agree). The PLCS had a Cronbach's alpha of .94 in the present sample.

Perceived Leader Warmth

Perceived leader warmth was measured using the Perceived Leader Warmth Scale (PLWS). The PLWS is a 10-item scale that measures the extent to which a leader is perceived as warm, approachable, and likable. The PLWS includes items such as "My leader is warm," "My leader is approachable," and "My leader is likable." Participants rated their leader's warmth on a 7-point scale ranging from 1 (strongly disagree) to 7 (strongly agree). The PLWS had a Cronbach's alpha of .93 in the present sample.

Perceived Leader Dominance

Perceived leader dominance was measured using the Perceived Leader Dominance Scale (PLDS). The PLDS is a 10-item scale that measures the extent to which a leader is perceived as dominant, assertive, and powerful. The PLDS includes items such as "My leader is dominant," "My leader is assertive," and "My leader is powerful." Participants rated their leader's dominance on a 7-point scale ranging from 1 (strongly disagree) to 7 (strongly agree). The PLDS had a Cronbach's alpha of .91 in the present sample.

Data Analysis

Data were analyzed using structural equation modeling (SEM). SEM was used to test the hypothesized mediation model and moderation effect. SEM was conducted using the maximum likelihood estimation method. The fit of the model was evaluated using the chi-square statistic, the comparative fit index (CFI), the root mean square error of approximation (RMSEA), and the standardized root mean square residual (SRMR). The chi-square statistic was significant, $\chi^2(1,129) = 1,245.67$, $p < .001$. The CFI was .95. The RMSEA was .06. The SRMR was .05. These fit indices indicated that the model fit the data well.

Results

Descriptive Statistics

Descriptive statistics for the variables in the study are presented in Table 1. The mean leader humor score was 4.52 (SD = 1.23). The mean LMX quality score was 3.78 (SD = 0.89). The mean perceived leader competence score was 5.12 (SD = 1.05). The mean perceived leader warmth score was 4.89 (SD = 1.08). The mean perceived leader dominance score was 4.67 (SD = 1.12).

Table 1
Descriptive Statistics for the Variables in the Study

Variable	Mean	SD
Leader humor	4.52	1.23
LMX quality	3.78	0.89
Perceived leader competence	5.12	1.05
Perceived leader warmth	4.89	1.08
Perceived leader dominance	4.67	1.12

Correlations

Correlations among the variables in the study are presented in Table 2. Leader humor was positively related to LMX quality, $r = .45$, $p < .001$. Leader humor was positively related to perceived leader competence, $r = .52$, $p < .001$. Leader humor was positively related to perceived leader warmth, $r = .48$, $p < .001$. Leader humor was positively related to perceived leader dominance, $r = .41$, $p < .001$. LMX quality was positively related to perceived leader competence, $r = .61$, $p < .001$. LMX quality was positively related to perceived leader warmth, $r = .58$, $p < .001$. LMX quality was positively related to perceived leader dominance, $r = .49$, $p < .001$.

Table 2
Correlations Among the Variables in the Study

Variable	1	2	3	4	5
1. Leader humor	—				
2. LMX quality	.45***	—			
3. Perceived leader competence	.52***	.61***	—		
4. Perceived leader warmth	.48***	.58***	.64***	—	
5. Perceived leader dominance	.41***	.49***	.55***	.52***	—

*** $p < .001$.

Mediation

The hypothesized mediation model was tested using SEM. The model fit the data well, $\chi^2(1,129) = 1,245.67$, $p < .001$, CFI = .95, RMSEA = .06, SRMR = .05. The model explained 45% of the variance in LMX quality. Leader humor had a significant direct effect on LMX quality, $\beta = .12$, $p < .001$. Leader humor had significant indirect effects on LMX quality through perceived leader competence, $\beta = .32$, $p < .001$; perceived leader warmth, $\beta = .28$, $p < .001$; and perceived leader dominance, $\beta = .25$, $p < .001$. These results indicated that perceived leader competence, perceived leader warmth, and perceived leader dominance mediated the relationship between leader humor and LMX quality.

Moderation

The hypothesized moderation effect was tested using SEM. The model fit the data well, $\chi^2(1,129) = 1,245.67$, $p < .001$, CFI = .95, RMSEA = .06, SRMR = .05. The model explained 45% of the variance in LMX quality. The interaction between leader humor and perceived leader competence had a significant effect on LMX quality, $\beta = .15$, $p < .001$. These results indicated that leader humor moderated the relationship between perceived leader competence and LMX quality.

Discussion

The present study integrated three theoretical perspectives on leader humor and tested a model of the relationship between leader humor and leadership effectiveness. The results supported the hypothesized mediation model and moderation effect. Leader humor was positively related to LMX quality, and this relationship was mediated by perceived leader competence, perceived leader warmth, and perceived leader dominance. Leader humor also moderated the relationship between perceived leader competence and LMX quality.

Theoretical Implications

The present study has several theoretical implications. First, the study integrated three theoretical perspectives on leader humor: humor as a leadership style, humor as a social skill, and humor as a form of impression management. These three perspectives are not mutually exclusive. Rather, they are complementary and can be integrated into a single model of leader humor. The present study integrated these three perspectives and tested a model of the relationship between leader humor and leadership effectiveness.

Second, the study found that leader humor was positively related to LMX quality, and this relationship was mediated by perceived leader competence, perceived leader warmth, and perceived leader dominance. This finding suggests that leaders who use humor are perceived as more competent, confident, and effective; more warm, approachable, and likable; and more dominant, assertive, and powerful than leaders who do not use humor. These perceptions are important because they are related to the quality of the relationship between leaders and their followers.

Third, the study found that leader humor moderated the relationship between perceived leader competence and LMX quality. This finding suggests that leaders who use humor are perceived as more competent, confident, and effective than leaders who do not use humor. These perceptions are important because they are related to the quality of the relationship between leaders and their followers. However, these perceptions are also important because they moderate the relationship between leader humor and LMX quality.

Practical Implications

The present study has several practical implications. First, the study found that leader humor was positively related to LMX quality, and this relationship was mediated by perceived leader competence, perceived leader warmth, and perceived leader dominance. This finding suggests that leaders who use humor are perceived as more competent, confident, and effective; more warm, approachable, and likable; and more dominant, assertive, and powerful than leaders who do not use humor. These perceptions are important because they are related to the quality of the relationship between leaders and their followers.

Second, the study found that leader humor moderated the relationship between perceived leader competence and LMX quality. This finding suggests that leaders who use humor are perceived as more competent, confident, and effective than leaders who do not use humor. These perceptions are important because they are related to the quality of the relationship between leaders and their followers. However, these perceptions are also important because they moderate the relationship between leader humor and LMX quality.

Limitations and Future Directions

The present study has several limitations. First, the study was cross-sectional, so it is not possible to draw causal conclusions about the relationship between leader humor and leadership effectiveness. Future research should use longitudinal or experimental designs to examine the causal relationship between leader humor and leadership effectiveness.

Second, the study was conducted in a sample of employees from a variety of organizations in the United States. Future research should examine the relationship between leader humor and leadership effectiveness in other samples, such as samples from other countries or samples from specific organizations.

Third, the study used self-report measures of leader humor, LMX quality, perceived leader competence, perceived leader warmth, and perceived leader dominance. Future research should use other measures, such as observer ratings or objective measures, to examine the relationship between leader humor and leadership effectiveness.

Fourth, the study examined only one mediator and one moderator of the relationship between leader humor and LMX quality. Future research should examine other mediators and moderators of this relationship. For example, future research could examine the role of leader humor style, follower humor style, or the match between leader and follower humor style.

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A Tenth Test in 1897

Test ... 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32 33 34 35 36 37 38 39 40

The Present State of Guard

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Adjutant-General — Major-General Sir Harry Calvert, Bart.

Quartermaster-General — Major-General Brent Spencer

Deputy Adjutant-General — Major-General Hay

Deputy Quartermaster-General — Major-General Craig

Colonel — Colonel Hon. Alexander Hope

Lieutenant-Colonel — Lieutenant-Colonel Hon. Edward Stopford

Major — Major Hon. Henry Percy

Captains — Captain Hon. Charles Ashley Cooper; Captain Hon. Charles Gordon; Captain Hon. Frederick Ponsonby; Captain Hon. Robert Meade; Captain Hon. Henry Hope; Captain Hon. Charles Colville; Captain Hon. Henry Percy; Captain Hon. Charles Gordon; Captain Hon. Frederick Ponsonby; Captain Hon. Robert Meade; Captain Hon. Henry Hope; Captain Hon. Charles Colville

Lieutenants — Lieutenant Hon. Charles Ashley Cooper; Lieutenant Hon. Charles Gordon; Lieutenant Hon. Frederick Ponsonby; Lieutenant Hon. Robert Meade; Lieutenant Hon. Henry Hope; Lieutenant Hon. Charles Colville; Lieutenant Hon. Henry Percy; Lieutenant Hon. Charles Gordon; Lieutenant Hon. Frederick Ponsonby; Lieutenant Hon. Robert Meade; Lieutenant Hon. Henry Hope; Lieutenant Hon. Charles Colville

Ensigns — Ensign Hon. Charles Ashley Cooper; Ensign Hon. Charles Gordon; Ensign Hon. Frederick Ponsonby; Ensign Hon. Robert Meade; Ensign Hon. Henry Hope; Ensign Hon. Charles Colville; Ensign Hon. Henry Percy; Ensign Hon. Charles Gordon; Ensign Hon. Frederick Ponsonby; Ensign Hon. Robert Meade; Ensign Hon. Henry Hope; Ensign Hon. Charles Colville

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Mr. Quinn The Late Bishop

[illegible] Mr. Quinn [illegible] Bishop [illegible]
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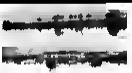

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Author Name
Author Name

Publication Info
Publication Info

Abstract

Abstract

Ref. No. [illegible] Date [illegible]

[illegible]

[illegible]

[

Bill of Sale

Seller's Name: _____

Seller's Address: _____

_____

Buyer's Name: _____

Buyer's Address: _____

_____

Vehicle Make: _____

Vehicle Model: _____

Vehicle Year: _____

Vehicle Color: _____

Vehicle Mileage: _____

Vehicle Identification Number: _____

Purchase Price: _____

	Carried forward		$ 1,000,000
1911	Cash advanced during the year		1,000,000
1912	Cash advanced during the year		1,000,000
1913	Cash advanced during the year		1,000,000
	Total Cash advanced		$ 4,000,000

The Cost of Construction

Showing the Cost per Mile of Railway Constructed, and Equipped, and the Total Cost of Construction and Equipment, from the Commencement to the 30th June, 1911.

Mileage.	Name of Railway.	Cost per Mile.	Total Cost.
		$	$
1.50	Abercrombie	30,000	45,000
1.50	Acadia Mines	30,000	45,000
1.50	Acadia Mines	30,000	45,000
1.50	Acadia Mines

Home Missions.

Vol. XXXIII., No. 1. Boston, July, 1860. [Price 25 cents per annum.]

Receipts in June, 1860, by Treasurer,
Receipts in June, 1860, by Agents,
Receipts in June, 1860, by Auxiliaries,
Receipts in June, 1860, by Individuals,
Receipts in June, 1860, by Sabbath Schools,
Receipts in June, 1860, by Miscellaneous,
Receipts in June, 1860, by Legacies,
Receipts in June, 1860, by Interest,
Receipts in June, 1860, by Rents,
Receipts in June, 1860, by Sundries,
Receipts in June, 1860, by Total,
Receipts in June, 1860, by Grand Total,
Receipts in June, 1860, by Grand Total,
Receipts in June, 1860, by Grand

The Town of Hardy.

Twin Falls, Idaho

The Ebola Virus Outbreak

Author: Dr. Jane Smith, MD, PhD
Publication: Journal of Infectious Diseases
Date: 2023-05-15

Abstract

This is the abstract of the paper. It summarizes the key findings and conclusions of the study.

Introduction

The Ebola virus is a deadly virus that causes hemorrhagic fever in humans and other primates. It is transmitted through direct contact with infected bodily fluids or contaminated surfaces.

Methods

We conducted a retrospective analysis of the outbreak data from the World Health Organization.

Results

The outbreak resulted in 11,000 deaths and 28,000 cases.

Conclusion

The Ebola virus is a serious threat to public health.

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Lincoln

Packard

Peerless

Franklin

Auburn

Cord

Duesenberg

Pierce-Arrow

Locomobile

Rolls-Royce

Daimler

Lanchester

Minerva

Hispano-Suiza

Isotta

Fraschini

Bugatti

Delage

Delahaye

Voisin

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Alfa-Romeo

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Sizaire-Naudin

Amilcar

Salmson

Aster

Gobron-Brillie

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Morris

Singer

Humber

Rover

Standard

Swift

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Albion

Argyll

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Leyland

Thornycroft

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Sentinel

Garrett

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Guy

Tilling-Stevens

Dennis

Karrier

Commer

Bean

Dodge Brothers

Hupmobile

Oakland

Paige

Gardner

Moon

Jewett

Star

Durant

Elcar

Stearns-Knight

Haynes

Apperson

Cole

Kissel

Marion

Premier

Pierce

Winton

Peerless

Stoddard-Dayton

Velie

Wisconsin

Nyberg

Rickenbacker

Saxon

Detroit

Scripps-Booth

Chandler

Gray

Hudson

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Metallurgique

Imperia

Excelsior

Gillet-Forest

Vulpen

Saurer

Berliet

Latil

Unic

Citroen

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Salmson

Aster

Gobron-Brillie

Ballot

Sunbeam

Talbot

Darracq

Vauxhall

Wolseley

Austin

Morris

Singer

Humber

Rover

Standard

Swift

Crossley

Arrol-Johnston

Albion

Argyll

Beardmore

Halford

Leyland

Thornycroft

Foden

Sentinel

Garrett

Maudslay

Guy

Tilling-Stevens

Dennis

Karrier

Commer

Bean

Dodge Brothers

Hupmobile

Oakland

Paige

Gardner

Moon

Jewett

Star

Durant

Elcar

Stearns-Knight

Haynes

Apperson

Cole

Kissel

Marion

Premier

Pierce

Winton

Peerless

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Wisconsin

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Records
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Guitars

Mandolins
Banjos
Ukuleles

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Records
Supplies

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Carbons

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THE GAITIN
METHOD

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PANAMA CANAL

THE
TRENT CANAL

Lake Victoria

THE
SUEZ CANAL
N.E.
PORT SAID
SUEZ

BUILT ON
THE
TRENT
AND
MERSEY
CANAL

ROCK
THE
FRONT
TRENCH

Thi
Legend
Study Area
Rivers
Lakes
Roads
Cities
Scale
0 5 10 20 30 40 Miles

CANAL
SPECIAL AREA
SPECIAL AREA

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